



Experiments with Amalgam.

By DR. WM. CASS GRAYSTON, Scarborough, Eng.

Observation and clinical experience count for something. During nearly twenty years, I have invariably noticed that my amalgam fillings looked perfect for at least six months after insertion. In two years they showed the usual "change of form." The extent of this depends upon the amalgam used, on the shape of the cavity and on the force, or stress, of mastication.

I have used many makes, and judging by the work of others, as well as my own, I have found it an unreliable material. Experiments as to shrinkage and expansion are of comparatively small value.

Six years ago I and another dentist each filled a large cavity in extracted molars. To-day these fillings appear perfect under a magnifying glass. The amalgam used proved an utter failure in the mouth. I have made wafers of amalgam, and put them away in my cabinet for lengthy periods. There was no change of form or curling up of the edges. I have placed amalgam on the backs and around the pins of plate teeth, and time has brought no visible alteration.

Some years ago I soldered platinum posts to the pins of plate teeth, made undercuts in the faces of the roots of upper incisors and canines, forced the posts in the roots with cement and filled the undercut, and built up the backs of the teeth with amalgam in the mouth. In every case the amalgam curled right away from the porcelain in from six months to a year. Cutting dovetail grooves in the porcelain made no difference. I then backed with platinum and cut away the porcelain so that the backing made a kind of retaining flange. The result was the same. I then backed with pure gold and had no more trouble; the amalgam adhered to the gold, or at any rate did not curl away. I do not advocate this method. I am merely relating experiences.

Change of form appears to be brought about principally by the force of mastication, and is modified somewhat by the shape of the cavity. The stronger mechanical hold the cavity has on the amalgam, the less risk of rapid or great change of form; but, given sufficient stress, change of form will surely take place.

The question of shrinkage is interesting, but it plays a small part in the failure of amalgam to save teeth. Give me an amalgam that will be in as good form (in the mouth) in six years as it is in six months, and I will gladly put up with whatever shrinkage has taken place in six months.

We have no proof that amalgam goes on shrinking indefinitely, and as it behaves in the mouth very differently from out of the mouth we can only put this down to force of mastication.

Dr. Black was the first to experiment in this direction, out of the mouth, but his two great discoveries, of the flow of amalgam, and the value of annealing, would, I think, have been even of greater value if shrinkage had—for the present at any rate—been left to take care of itself.

Let us have an amalgam that force does not affect. Let us have an amalgam that will always behave the same, if properly mixed; and then, let us still further improve it by eliminating shrinkage.

I am, of course, aware that a number of new amalgams have recently been "put on the market." That several manufacturers make "the only perfect one," but I am not aware that the flow or change of form of any of them has been continuously tested by intermittent pressure for about two years. Our patients will do this, however, perhaps a little too thoroughly for our complete satisfaction.

The Value of Antiseptic Mouth Washes.

By Dr. E. C. WALDEN, St. Louis, Mo.

It has only been within the last twenty years that attention has been called to the value of antiseptics in the care of the mouth and teeth. Attention was first called to this subject by Miller (*Die Mikroorganismen der Mundhöhle*), Leipzig, 1892. He showed that the means used up to that time, comprising various mechanical devices, together with the use of soaps, etc., were not as valuable as they had been supposed to be. Such methods, while removing the greater mass of food particles lodged between the teeth and in the small crevices in the mouth, did not prevent

the growth of bacteria in the oral cavity, and hence the processes of which these organisms were the cause were in no way affected by the use of these mechanical means. As a remedy for the evils caused by the growth of bacteria in the mouth, Miller suggested the use of antiseptics. The antiseptics in general use at that time were both germicidal and toxic, and hence their use in the mouth was out of the question. Although these substances destroyed the bacteria in the mouth, they were so toxic to the tissues with which they came in contact, causing them to break down and in many cases being the cause of extensive inflammations, much more disagreeable and dangerous than the organisms themselves. Although suggesting the use of antiseptics for use in the mouth, Miller did not go into the subject deep enough to determine what substances should be used.

This subject was taken up by subsequent investigators, and to them we are indebted for the knowledge which we now have upon the subject. These were the investigators who demonstrated that the stronger antiseptics were unfit for use in the care of the mouth and teeth. Substances like corrosive sublimate attack the tissues themselves and cause necrosis, while substances like alcohol not only have a deleterious effect upon the tissues with which they come in contact, but through their effect upon the nervous system they cause a dilatation of the blood vessels, which in the end may result in the chronic hypertrophy of these vessels. For these reasons it was necessary to look for other antiseptics which were not toxic in any degree to the tissues; in fact, substances which would stimulate the tissues to healthy growth and at the same time would destroy all bacteria.

As a consequence attention was turned to the milder antiseptics, the aromatic oils. These substances, while not nearly so potent as antiseptics, have the advantage of not being harmful to the tissues. By the proper combination of these oils, a product can be obtained which possesses excellent antiseptic properties, and at the same time such a combination will promote a healthy growth of the tissues.

These investigations were followed by a demand from the dentist for such products, and as a consequence many so-called mouth antiseptics have been placed upon the market. Perhaps no other class of preparations have so large an annual sale as the various antiseptic mouth washes to be found upon the market.

Practical experience has demonstrated that all of these preparations are not equally valuable, and that many of them are worthless, if not harmful to the mouth and teeth. A perfect mouth antiseptic must meet the following conditions:

First—It must be antiseptic, destroying the organisms in the oral cavity or inhibiting the growth of any bacteria not destroyed.

Second—It must be harmless to the tissues with which it comes in contact, and should stimulate these tissues to healthy growth.

Third—If administered internally, it should not be toxic, even when taken in large quantity.

Fourth—It should be of agreeable taste and odor.

The great number of antiseptic preparations upon the market, and the great difference there is in their action has made it necessary that a careful investigation be made of these preparations. The demand for such an investigation has prompted this series of experiments. In this series but a limited number of the preparations have been tested. The ones tested, however, are those most commonly used. Samples of the following preparations have been purchased: Euthymol, Listerine, Pasteurine, Borolyptol and Glycothymoline.

Before entering upon a description of these experiments it will not be out of place to speak of the conditions met with in the mouth.

Micro-Organisms of the Oral Cavity. The mouth is very much like a petri dish, in which is a medium suitable for the propagation of almost all varieties of bacteria, pathogenic and non-pathogenic. Here not only are found the common bacteria of the air, which, for the most part, are

harmless, but also those organisms which are pathogenic, which may be free in the air or may gain entrance to the oral cavity with the food taken into the mouth or through the careless, but nevertheless almost universal habit of holding substances of all kinds between the teeth and lips, no attention being paid to the condition of the object previous to its being placed between the lips. These organisms on gaining entrance to the mouth find there a suitable place for growth, the moisture, food and temperature all being favorable; as a consequence they rapidly increase in number.

Recent investigations have demonstrated the presence of the Klebs-Loeffler (diphtheria) bacillus in the mouths and throats of many healthy individuals, and the presence in the mouth of streptococci has long been recognized. If the tissues of the mouth are in a perfectly normal condition such organisms may exist in the mouth for a longer or shorter time without danger, but should the mouth be in an unhealthy condition the presence of these organisms is a constant menace to health. Besides the two varieties mentioned, which are dangerous to the health of the entire body, there are present in the mouth many organisms which are deleterious to single organs. Many of the common air bacteria attack the food particles, breaking down the highly complex combinations into simpler

substances, and in this process acids are formed. These acids attack the enamel of the teeth and eventually erode it, thus exposing the soft internal structures to the further attacks of the bacteria.

**Effects of
Antiseptics
in the Mouth.**

As the result of previous investigations we know that there is no antiseptic which perfectly sterilizes the mouth. Corrosive sublimate, when used in 1 to 500 strength, does not kill all of the bacteria present in the buccal cavity. There always remain a few bacteria in the little clefts in the tissues, in the openings of the salivary ducts, in the folds of the papillæ, and in the crypts of the tonsils, which it is impossible to clear away by any solution. These bacteria may be retarded in their development for a variable length of time, according to the strength of the solution, but after the effects of the drug have passed away, these organisms which were not killed will again begin to develop.

Rose has shown in his interesting paper (*Zeitschrift für Hygiene*, 1901) that immediately after the use of corrosive sublimate all the bacteria in the mouth are either killed or are inhibited in their growth. Fifteen minutes after the use of this antiseptic 9 per cent of the bacteria developed; thirty minutes later 10 per cent developed; two and one-half hours later 23 per cent developed, and four hours after the use of the antiseptic 75 per cent of the bacteria developed. That is, at the end of four hours there were present in the mouth three-quarters as many bacteria as there would have been had no antiseptic been used. Some of the organisms found later were those which had escaped being destroyed by the antiseptic, while others were those entering the buccal cavity by various ways after the antiseptic had been used. It is evident from this that it is impossible to keep the mouth in a sterile condition for any great length of time. It is, therefore, necessary that antiseptics be used often in order that the development of bacteria may be restricted as much as possible.

As has already been intimated, strong antiseptics, like corrosive sublimate, are not suitable for use in the mouth. Their action is too severe and the damage done to the mucous lining of the mouth is far greater than are the advantages gained by having the mouth in a perfectly sterile condition. Two facts, therefore, must be constantly kept in mind; first, the preservation of the normal tissues, and secondly, the sterilization of the mouth and teeth. Care must be taken to use only those substances which conform to these limitations and not substances opposed in their properties as is corrosive sublimate.

Rose has also shown that the number of bacteria varies greatly at different times of the day. The bacteria are most abundant after the night's rest and before food is taken in the morning. After the morning meal the bacteria are less abundant, but they steadily increase in numbers

until the next meal is taken, when they again decrease. In the mastication of the food great numbers of bacteria are mixed with the food particles and are swallowed with them; ultimately these germs are destroyed by the stomachic and intestinal secretions. But, while many of the organisms are destroyed in this way, great numbers still remain in the mouth, and these find the conditions for their development much more suitable than before the food was taken. During the process of mastication small food particles are lodged between the teeth and in the other crevices of the oral cavity, and these particles are immediately attacked by the bacteria. It is best, therefore, to use some device in conjunction with the mouth antiseptic in order to accomplish the best results. Here is where the older methods are of great service. The use of the tooth brush in conjunction with the antiseptic dislodges the food particles and the incrustations on the teeth, and in this way removes those substances most easily acted upon by the bacteria and also exposes a greater number of the organisms to the effects of the antiseptic. Hence it is only by the use of the antiseptic in conjunction with the tooth brush that the best results can be expected.

It has already been shown that the stronger antiseptics cannot be used as mouth washes and that combinations of the aromatic oils must be used instead. By the combination of several of these oils better results will be obtained than by the use of a single one. There are several of these combinations upon the market at present, and the following experiments show their comparative value.

Rose has suggested a line of experiments for such a research, and his method has been followed in this investigation.

After the meal has been taken, the mouth was thoroughly washed with sterile water and the tooth brush was vigorously applied. Fifteen minutes later the mouth was thoroughly rinsed with the solution to be tested, the solution being held in the mouth for one minute. Fifteen minutes later the mouth was rinsed with twenty cubic centimeters of sterile water. One cubic centimeter of this rinse water was then plated in agar-agar; one hour after the use of the antiseptic the mouth was again washed with twenty cubic centimeters of sterile water, and one cubic centimeter of this plated. At the end of the second hour the same process was repeated. All three plates were then placed in the incubator at a temperature of 37 degrees Centigrade for twenty-four hours. At the end of this period the plates were removed from the incubator and the colonies which had developed counted under the microscope. The counts made from the plates taken fifteen minutes, one and two hours after the use of the antiseptic were taken to represent

Experimental Tests
by the
Author.

the value of the preparation as an antiseptic. In order to have some control with which to compare the figures so obtained, plates were made in the same manner after using nutrient bouillon instead of an antiseptic solution. The figures obtained in this case were taken to represent the average growth in the oral cavity of bacteria under normal conditions. Each of the preparations was tested several times, and the conditions prevailing at the time of the experiments were as nearly the same as was possible.

From the table which follows it will be seen that in every case the number of bacteria which developed after the use of an antiseptic solution was less than in the case of the bouillon. This would indicate that all of the preparations used were of value as antiseptics. In order to get their true worth as antiseptics, it was assumed that the figures obtained in the case of the bouillon gave the normal number of bacteria, and therefore represented 100 per cent development. The figures obtained in the experiments with the various antiseptics, if divided by the figures obtained in the bouillon experiment, would give their respective development. For this purpose the figures obtained from the three counts, fifteen minutes, one, and two hours after the use of the preparation, were added and their mean taken, and from these figures the percentage development in each case was determined.

The following table gives the results so obtained:

Preparation Used.	15 Minutes.	1 Hour.	2 Hours.	Av. Development.	Activity.	Effectiveness.
Bouillon	20,400	72,000	96,000	62,800	100%	0%
Listerine	6,320	14,880	23,680	14,960	23%	77%
Euthymol	6,845	12,580	36,840	18,755	29%	71%
Pasteurine	3,680	13,440	20,360	12,460	19%	81%
Glycothymoline	4,840	10,560	26,240	13,880	22%	73%
Borolyptol	6,120	29,770	34,640	23,510	38%	62%

From this table it will be noticed that the various preparations are not equal in their value as antiseptics. The preparations tested are those which are at present in most general use, and it is surprising that there should be such a great variation in their effectiveness.

As a result of these experiments and what has been said the following conclusions may be drawn:

Strong antiseptics cannot be used in the oral cavity on account of the great danger that accompanies their use.

Combinations of the aromatic oils, although not so effective as substances like corrosive sublimate, are much better suited for use in the buccal cavity.

For the best results the tooth brush must be used in conjunction with the antiseptic.

On account of the conditions met with in the mouth, it is impossible to keep it sterile for any great length of time, hence it is necessary to use antiseptics frequently.

The various mouth antiseptics upon the market differ widely in their antiseptic and germicidal powers.

First Production of Dental Porcelain.—A Criticism.

By WILLIAM H. TRUEMAN, D.D.S., Philadelphia, Pa.

The paragraph on page 634, *ITEMS OF INTEREST*, August, 1901, calls for more than a passing notice. Reminiscences published for the first time more than sixty years after the events which they recall have occurred, unsupported by recorded evidence, invite a challenge, especially so when they are accompanied, as in this case, by statements known to be inaccurate. It is there stated "that a dentist named Stockton, a relative of Edward White, who was the predecessor of S. S. White in the dental goods business, etc." Now, Samuel Wesley Stockton was not a dentist, he was a watchmaker and jeweler; Samuel Stockton White had no predecessor in the dental goods business; the business he so long and so successfully carried on originated with him. He was, indeed, the first, in Philadelphia, at least, who attempted to cater fully to a dentist's needs. Samuel W. Stockton, his uncle, was the first to establish what is now known as a dental depot; he was a man of marked peculiarities (I knew him well), and refused to extend his business beyond certain limits, and was not overly accommodating to his customers. S. S. White was in his employ, and received under him his business training. He noted the inconveniences dentists suffered from being unable to obtain many little things suited to their needs, and finding his employer indisposed to remedy this, started, in a very small way at first, a dental depot of his own on much broader lines.

Samuel Wesley Stockton was an enthusiastic experimenter in ceramics in the special line of producing or imitating the ornamental stones used in his business. Mr. Plantou had arrived in Philadelphia, from

France, a few years before, bringing with him some porcelain teeth, such as were then used in his native land. A few progressive dentists recognizing their advantages and defects, attempted their manufacture and improvement. One of these knowing Mr. Stockton's interest in ceramics showed him some of his crude efforts. Mr. Stockton was at once interested, took the matter up, and in a short time exhibited to his dental friend his results. It was what we would now call an all porcelain crown. It was so excellent an imitation of the natural organ that his friend at once said: "Mr. Stockton, if you can make teeth such as these and sell them at a moderate price, it will be a great convenience to us dentists, and you will have all you can do." This was about 1825, and was the beginning of his career as a manufacturer of artificial porcelain teeth. He was not the only one to attempt it, but he was, perhaps, the most successful.

As early as 1808, porcelain teeth were made in France capable of being soldered to metallic plates. We know this from the fact that there was then a controversy as to who was the first to provide them with platinum cramps, or pins, for this purpose, and the further fact that from that date on, writers treating of porcelain artificial teeth include the ways and means by which this may be accomplished. If there was any difficulty in producing a porcelain capable of withstanding the heat of the blowpipe, properly applied, it is very strange that these early writers failed to record it. I have gone over them many times, both the French and those who wrote in English, and have failed to note any special reference to it. Their methods, I am impressed, taxed the teeth much more than do those now in use.

During my early experience in a dental laboratory I frequently had in repair work to solder Stockton's teeth made in the early '40s, teeth that had been worn many years, and did so with much more confidence than others of a later date. His first gum teeth gave a great deal of trouble. The teeth were first fired, the gum color was then painted on and the teeth fired again. It was only a wretched imitation of the natural gum, but the gum invariably scaled off if the tooth was not properly presented to the grindstone, not infrequently burying itself in one's finger. These gums also frequently scaled off during soldering. If Mr. Beckers contributed anything of importance to the present perfection of porcelain artificial teeth, it is due to him that it should be known, and the part he took should be definitely stated with more reliable evidence of its correctness than a mere recollection looking back a long lifetime. He was not the first to produce a porcelain that would stand the heat of the blowpipe. We have ample evidence, on record, that such a porcelain was in use long before 1838, probably, indeed, before he was born.

It was said of Mr. Stockton that he carried his formulas in his head, compounding with his own hands behind locked doors the ingredients he used. At one time he made a tooth that the older dentists said could only be broken by being placed on an anvil and heavily struck with the swaging hammer. This was, of course, an exaggeration. So far as strength is concerned, either under stress or in the fire, they have never been surpassed. Either from a whim or some cause he ceased to use that formula, and even when he was no longer in the business refused to divulge the secret although offered a handsome price. Mr. Ash, in England, and Mr. Stockton on this side are the two most prominent pioneers in the commercial introduction of porcelain artificial teeth; they worked, however, on far different lines. Mr. Ash labored to produce a tooth to take the place of natural teeth on artificial dentures and to be used as natural teeth were; Mr. Stockton to produce a tooth to be soldered upon metallic plates. Both succeeded remarkably well. Both received much assistance from those of the dental and kindred professions; it is of interest, historically, that this should be placed on record, but, to be of value, it must be definite and accurate.





The Preparation of Roots for Crown and Bridgework.*

BY HART J. GOSLEE, D.D.S., Chicago, Ill.

VI.

Preliminary Requirements: Therapeutics. Feasibility of Devitalization: Physiological Considerations; Mechanical Considerations. Treatment of Hypertrophy, Free Exposure of the Root. Classification. Preparation for Shell or Telescope Crown: Requirements; Restoration of Continuity; Diminution of Coronal Proportions; Paralleling Converging or Diverging Teeth; Operative Procedure. Preparation for Shell or Telescope Crown with Porcelain Facing: Requirements. Preparation for Dowel Crown with Band: Requirements. Operative Procedure; Excising Incisors and Cuspids; Excising Bicuspid and Molars; Removal of Enamel: Use of Enamel Cleavers; Peripheral Trimming; Shaping Basal Surface. Preparation for Dowel Crown without Band: Requirements; Operative Procedure; Inseparable Dowels; Separable Dowels; Protection of Unsupported Walls. Preparation of Canals: Requirements; Operative Procedure. Treatment of Perforated Roots. Treatment of Fractured Roots: Posterior Teeth; Anterior Teeth, Prognosis.

Paramount among the obstacles in the pathway of success, permanency and comfort in crown and bridgework is the perfunctory, unskillful and profoundly indifferent methods so often employed in the procedure incident to the treatment and preparation of roots.

In the entire subject there is probably no one distinctive feature of such intrinsic importance as the practical, scientific and skillful prepara-

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tion of the remaining crowns and roots of teeth, for the reception of artificial crowns.

While the proper and necessary operative procedure may be arduous, and replete with attending difficulties, the physiological and mechanical requirements are equally exacting, and demand the same degree of care, precision and accuracy that would be essential to the preparation of the foundation for any superstructure designed as a permanent evidence of skill and usefulness.

More particularly is this true in our efforts, because the field of labor is confined to living sensitive tissues, which are so responsive to unnatural conditions that any apparent negligence must sooner or later manifest itself, not alone in evidences of failure, but also in the serious discomfitures accompanying the various stages of irritation.

These usually present in the nature of gingival inflammation, and periodontal and alveolar absorption, to which conditions may be attributed a very large percentage of the troubles arising, and the absolute loss of many teeth. The common and exciting cause of such prevalent and sometimes discouraging results can invariably be traced to faulty and imperfect *adaptation* of the artificial crown, which in turn reverts, primarily, to inadequate and unskillful *preparation* of the root supporting it.

As clinical experience proves most conclusively that comfort and permanency depend upon a conservation or reproduction of the natural conditions, such liabilities decrease of course in proportion to the degree of accuracy observed in the operative procedure.

And such a degree of accuracy may only be obtained by an appreciation of the significance and importance of the requirements, a broad comprehension of the underlying mechanical principles, and a thorough, conscientious execution of the details is necessary.

To facilitate this the consideration of the subject must necessarily be in accordance with a more or less scientific and systematic arrangement, in the order of the practical application of the principles and technique involved.

Preliminary Requirements.

When it has been determined that an artificial crown is indicated, the first essential features to be observed should always include a consideration of those requirements constituting the preliminary operative procedure incident to placing the roots in the most favorable condition possible for the subsequent permanent attachment of the crown.

The very *first* detail is obviously that of the
Therapeutics. therapeutic treatment necessary in securing an *aseptic* condition of the root, including pulp canals and surrounding tissues.

This should invariably precede the removal or destruction of any of the remaining walls, because of the facility which their retention affords for the application of the rubber dam, which is essentially desirable and advantageous in rendering the field immune from secretions while medicinal applications are being made.

After the removal of all disintegrated structure, the usual remedial agencies indicated by the requirements and the existing conditions, should be consecutively applied, until *thorough asepsis*, sufficient to preclude any possibility of subsequent disease or disintegration, is obtained.

When this has been successfully accomplished, the pulp canals should be thoroughly filled throughout their entire length, irrespective of the style of crown indicated, and the root filling then temporarily covered and protected with cement to exclude the deteriorating influences of moisture during its hardening and crystallization.

Feasibility of Devitalization.

The problem of the feasibility of sacrificing the vitality of pulps in teeth which are to be subsequently crowned is one of great importance, and is a portion of the operative procedure incident to the preparation of such teeth, which requires the most conscientious and conservative consideration.

For many years no special thought was given to this, and such teeth as seemed to indicate restoration by crowning were treated much in the same manner as though fillings were to be inserted.

The frequency of subsequent troublesome manifestations, however, including the ultimate death of pulps with the attending consequences of such pathological conditions as virulent periodontal inflammations and alveolar abscesses, have since caused the subject to be more carefully considered, until it is now most generally conceded to be a safer precaution, in a great majority of cases to destroy such pulps as a prophylactic procedure, as well as to facilitate the necessary mechanical preparation, when the crown is to entirely cover the end of the root.

Since it is now a more or less generally acknowledged belief of the most eminent authorities that the physiological function of the pulp terminates with complete development of the tooth, and that it is not necessary to its vitality, stability and longevity after maturity, providing that the pulp cavity is perfectly filled, there seems to be no good logical reason for its preservation, taking into account the modern aseptic means of removing it and treating and filling the canals.

Especially is this true where a crown is indicated, because the abnormal encasing of the tooth so as to practically isolate it must at least diminish

the external influences of secretions and temperature upon the nerve and blood supply of the pulp; and because usually such teeth have already been subjected to the irritating and devastating influences of caries, each of which seems but to invite and pave the way for ultimate destructive processes.

Other deleterious influences may come from the irritating action of the cements used in mounting, or from the effects of the *shock*, or overstimulation induced by the necessary mechanical preparation, either of which may often prove important factors in rendering such teeth susceptible to a "slow but often complete and unnoticed destruction."

All things considered, the prophylactic measure seems the conservative one, and as modern scientific root treatment offers no palpable excuse for subsequent pathological conditions, it seems that the orthodox dogma of *preservation* is inapplicable to a great majority of cases, where experience and judgment teach us the demand for a perhaps more "radical" but manifestly *safer* procedure.

The contraindication for such treatment would be in the mouths of patients under sixteen years of age, where in all probability complete development of the tooth had not yet been attained. In such instances, however, it would be as unwise to pass the crown entirely beneath the gum as it would be to destroy the vitality of the pulp, unless both were necessary. And after fifty years of age the necessity for such treatment is often greatly diminished because of the physiological phenomena of the gradual atrophy of the pulp, and the formation of secondary dentine, which so lessens the sensitiveness of the structure as to admit freely of the necessary preparation, while reducing the probability of the ultimate occurrence of pathological conditions to a minimum.

Occasional exceptions may also be warranted in those cases of abnormal development, faulty enamel formation, extensive abrasion as a result of attrition, and where the absence of adjacent and occluding teeth makes necessary but little, if any, preparation, but such indications can only be governed by experience and judgment.

Because of these considerations applying particularly to the posterior teeth, where the shell or telescope crown is indicated, and where the removal of a considerable portion of the remaining tooth structure becomes an *absolute requirement*, the destruction of the pulp is usually imperative as a means of *making possible* and *facilitating* the necessary preparation in the diminution of the coronal proportions of the natural crown.

When the vitality is preserved, this procedure, always exacting, is ordinarily so *difficult* that it must be either perfunctorily and negligently

Mechanical Considerations.

performed, or else the patient must be made to tolerate an exceedingly and often excruciatingly painful operation.

Frequent evidences of flagrant indifference and negligence are so manifest as to prove conclusively that in a large majority of cases the vigorous efforts necessary to secure the best and most successful results may *only* be obtained under the most *favorable* conditions.

Treatment of Hypertrophy.

In instances where an exuberant growth or hypertrophy of pulp or gum tissue is present, or may have almost entirely covered the end of the root, some difficulty may be experienced in applying the dam and pursuing the necessary course of treatment.

Both may be greatly facilitated, however, by the immediate excision and removal of such tissue at the first sitting, and, if the continuity of the root be destroyed by disintegration, or its length will not admit of the application of the clamp and rubber dam, a temporary restoration can be easily effected by adjusting a band of German silver closely encircling the circumference of the root, as soon as the suppression of the hemorrhage, by the use of styptics, will permit.

Such a band, if properly and carefully fitted to the neck of the root, and trimmed so as to possess no sharp or irregular edges, and not to interfere with the occlusion, will at once admit of the application of the dam by adjusting the clamp over it, and may remain in place and be worn with comfort until the necessary treatment and final filling of the canals has been accomplished.

If filled flush to the edge with temporary stopping at the end of each treatment, it further serves to hermetically seal the dressing within the root, and to compress the tissues so as to afford a free exposure of the periphery.

Free Exposure of the Root.

During the process of treatment in all badly broken down roots some means should *always* be employed to compress the tissues in such manner as to freely expose the end, which greatly facilitates the fitting of the band, or the adjustment of the crown, and materially lessens the usual discomfiture attending the operation.

When the use of a temporary band is not indicated, or seems unnecessary, the same advantages may be gained by packing temporary stopping into and over the end of the root, and *under* the free margin of the gum.

If the root is too shallow to anchor it securely, it may be so retained by packing tightly against the adjacent teeth, or held firmly by ligatures

attached to them, or by inserting a small sharp tack through it and into the tooth structure.

In instances where the accumulation of gases demand some vent, a perforation may be made through the stopping at a convenient point.

Care should also be exercised to prevent *undue pressure*, which, if existing for an indefinite time, might possibly cause injury to peridental membrane or surrounding tissues, as a result of protracted lack of circulation.

Classification.

The principles involved in the necessary preparation of roots are governed, of course, by the particular style of crown indicated, and, while crown work is divided into *two* general classes, according to the method of attachment employed, a variation in the essential details of their individual construction requires that each class be subdivided, and that the subject be considered in *four* general classes.

In order to meet the requirements occasioned by this variation, each class will be considered separately, and are as follows:

Preparation for shell or telescope crown.

Preparation for dowel crown with band.

Preparation for shell or telescope crown with porcelain facing.

Preparation for dowel crown without band.

Preparation for Shell or Telescope Crown.

The detail of procedure indicated by the requirements for a shell or telescope crown, because of being generally confined to the posterior teeth, is usually the most difficult, and should be closely observed.

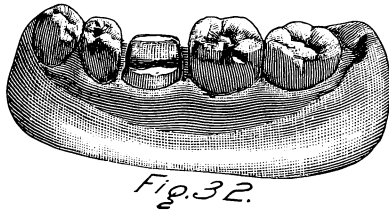
In those instances where the ravages of extensive decay have caused the destruction of the remaining walls of the natural crown, so as to carry the cervical border at some point within or beyond the free margin of the gum, some means of permanent restoration of the continuity of the root is usually advisable.

This prevents the possible fracturing of unsupported walls during their preparation; adds materially to the integrity of the root; greatly facilitates the fitting of the band, and overcomes the probability of subsequent disintegration arising from an imperfect adaptation of the band to the margins of deep cervical pockets.

Such restoration can usually be best accomplished with *amalgam*, the

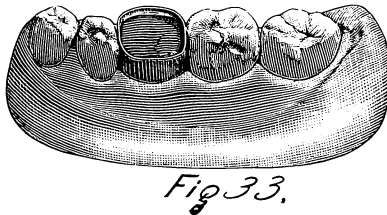
use of which affords a better opportunity for securing a close adaptation between it and the margins of the root, with the assurances of a greater degree of permanency.

Where the edge of the band, however, *can* be fitted closely to the root at all points around its entire circumference, with a reasonable degree of certainty, and where the walls are weak, the use of cement for this purpose is preferable, because of the additional support rendered by its adhesive qualities, and because any further destruction of the tooth



structure for the purpose of securing retention is unnecessary; but when the extreme depth of the marginal edge (Fig. 32) makes a close adaptation of the band either *impossible* or *doubtful*, amalgam should be used.

In using amalgam adequate retention must be secured in the pulp chamber, or root canals if necessary. A thin circular matrix of German silver, ga. 34-36, should then be adapted, and so shaped as to make the restoration of suitable form to save further preparation. After adjusting



this, its inner surface should be coated with vaseline, oil, or any lubricating substance, to prevent adherence of the amalgam, and insure its easy removal after crystallization. To admit of and facilitate this the amalgam should never extend as high as the edge of the band, and a subsequent sitting is usually necessary. (Fig. 33.)

In roots where the entire crown has been destroyed, it is usually necessary to rebuild and restore a portion of it, in order to better and more securely sustain the artificial crown, by obtaining greater integrity between it and the root at the line of junction. This may be easily accomplished by adjusting the matrix, and firmly inserting a screw-post

into the most accessible canal, additionally fortified with cement (Fig. 34), and then building up with amalgam to the desired length and shape.

Diminution of Coronal Proportions. The diminution of the natural crown, or its remaining walls, in a manner favorable to the requirements, is frequently a very difficult procedure because of the usual inequality, in teeth of normal proportions, between the diameters of the crown and the cervix.

This requires and necessitates the removal of considerable tooth structure in order that the circumference may be reduced at every point

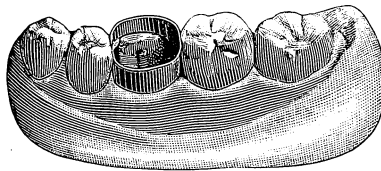


Fig. 34.

occlusally, and at the uniform expense of each surface, at least equal to the exact dimensions at the cervix.

While it is, of course, desirable to leave as much as possible of the remaining coronal portions, it will be observed from the illustrations (Fig. 35) that approximately about one-sixteenth of the structure from the axial walls, and the occlusal one-fourth must be removed.

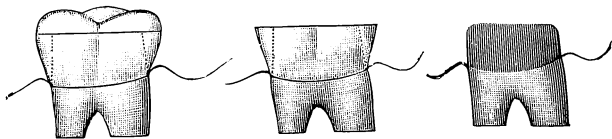


Fig. 35.

Such a requirement is not a hypothesis, but a physical and mechanical problem which must necessarily be closely observed, in order that it may be made possible for the band to approximate a close adaptation to the normally constricted neck; and to admit of a reproduction of the occlusal surface in the artificial crown possessing sufficient thickness to withstand the influences of constant attrition.

To further increase the opportunities for securing a closer continuity between crown and root, the remaining walls should not only be parallel,

but should be slightly *inverted*, so that the band may *fit more closely as it is pressed rootwise*, and thus prevent its edge from being forced *into* the gum tissue, instead of *under* or *within* the free margin.

This requirement is indisputably essential when the crown is intended to approach or pass beneath the gum, if comfort and permanency are to be obtained from the operation, and is one of the strongest arguments in favor of the devitalization of the pulp.

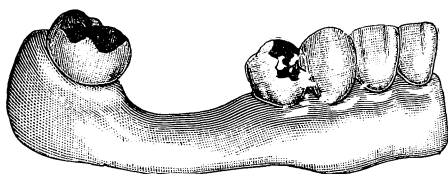


Fig. 36.

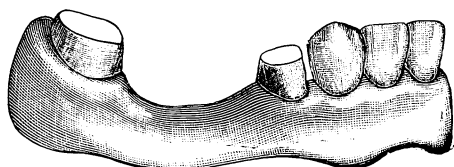


Fig. 37.

**Paralleling,
Converging or
Diverging Teeth.**

Owing to the general tendency of teeth to gravitate or tip toward the unoccupied area in interrupted arches (Fig. 36), in their preparation for bridgework it is essential to observe that the surfaces of each individual root presenting toward each other, are made absolutely perpendicular, as illustrated in Fig. 37.

Such a condition will frequently be found, and no matter how perfectly each individual root should be prepared, the presentation of perpendicular lines is necessary to admit of the adjustment of the bridge after completion.

Operative Procedure.

As this portion of the operation is particularly trying to the patient, as well as the operator, a good assortment of stones, disks and burs, kept sharp, even-edged, and truly mounted, is essential, and all unnecessary grinding should invariably be avoided.

When any of the walls of the tooth remain or approximate their full

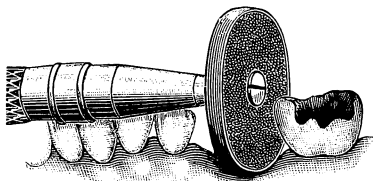


Fig. 38.

length, the first detail should be to undermine the enamel to the desired point by cutting away the dentine with a sharp bur. Such walls may then be easily broken down with the excising forceps, and much unnecessary grinding thus avoided. The surface of the occlusal end should be ground smooth with a thick-edge stone. The buccal and lingual walls may be reduced with a *thin-edge* stone of suitable diameter, in which it is essentially necessary to keep the revolving stone moving upward and downward upon the surface of the tooth, to prevent the formation of a shoulder or ridge at any point, and to assure a uniform reduction.

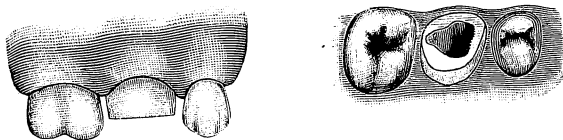


Fig. 39.

After these walls have been adequately reduced, the trimming of the approximal walls, usually the most difficult, is next in order. When they remain high enough to afford considerable support to the enamel, grinding must still be resorted to, as the cleavers will be found practically useless in detaching and removing it unless it is more or less disintegrated.

For such purposes a thin-edge stone or diamond disk of suitable diameter may be used, by beginning from the occlusal end, at a point about one-sixteenth of an inch from the periphery, and cutting through on a slight angle until the interproximal space is reached.

A small cross-cut fissure bur inserted into the interproximal space at right angles to the teeth, and brought occlusally with considerable pressure against the root, may often serve as a valuable supplement to the stone, or sometimes answer the purpose itself, if sufficient care be exercised to prevent mutilating the adjacent teeth, which may often be protected with a band matrix.

When adjacent teeth are absent, the procedure is less difficult, and may be accomplished with a blunt safe-edge stone, as illustrated in Fig. 38, or a stone possessing the shape of an inverted cone. The latter is very often found most useful in reducing the surfaces of molars.

If the remaining walls are short, and the enamel is somewhat disintegrated, the *cleavers* may be found very useful.

When sufficient diminution of the structure has been secured, the sharp corners should be nicely *rounded* with burs and sandpaper disks, and the necessary preparation is then completed.

The degree of accuracy thus obtained will be denoted by the freedom and facility with which the measurement wire may be detached from the root after being twisted taut, and the buccal and occlusal aspects should present, as indicated in Fig. 39.

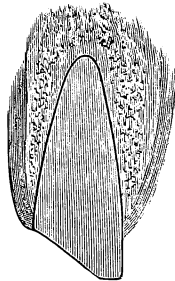


Fig. 40.

Preparations for Shell or Telescope Crown with Porcelain Facing.

Requirements. While the same general principles apply to the necessary preparation for a shell or telescope crown with porcelain facing, and the same detail of procedure is indicated, a variation is required.

This variation consists of grinding down the buccal wall sufficiently to accommodate the presence of the facing, as the area to be occupied by it must, of course, be gained at the expense of the remaining root. (Fig. 40.)

This should never be done, however, until after all other requirements, as before outlined, have been observed, and it may be done to even better advantage after the band has been fitted.

Preparation for Dowel Crown with Band.

The requirements of root preparation for a
Requirements. dowel crown with band are similar in peripheral features to the requirements for a shell or telescope crown, but differ in that *all* of the remaining natural crown must, of course, be sacrificed to more nearly approximate the gum line.

This is necessary because the line of junction between crown and root is made at this point in order to accommodate the artistic and esthetic presence of a porcelain facing.

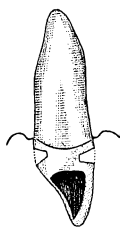


Fig. 41.

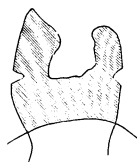


Fig. 42.

Operative Procedure.

In the operative procedure incident to removing the remaining portions of the natural crown, as much of it as possible should be cut away and broken down to a certain point, in order to avoid all unnecessary grinding.

In the incisors and cuspids this may be quickly
Excising Incisors and Cuspids. and easily accomplished by first undermining the remaining enamel with a bur, and then cutting grooves through it at a point which, when the crown is excised, will leave a projecting end of the root about one-sixteenth of an inch beyond the gum line. (Fig. 41.)

Care should be exercised in cutting the grooves entirely through the enamel, so as to relieve or reduce the shock, and prevent a fracture root-wise. The beaks of the excising forceps may be then placed in the grooves, and the crown easily and safely removed.

Excising Bicuspids and Molars.

In removing the remaining portion of the crowns of bicuspids and molars, the grooves and excising forceps possess the same advantages.

In their use, however, any remaining *continuity between buccal and lingual walls* must also be first attacked with a bur to destroy their integrity. (Fig. 42.) This, in conjunction with grooves, will facilitate their excision without shock or danger of fracture.

The remaining ledge of enamel upon this projecting end of the root, which has been purposely retained, for the time, must then be removed in order to bring the greatest diameter beneath the gum, where the line of junction between band and root is to be made. This can be best accomplished by the use of enamel cleavers designed for the purpose.

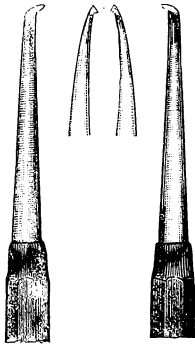


Fig. 43.

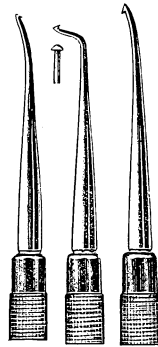


Fig. 44.

Use of Enamel Cleavers.

The use of enamel cleavers of any design may or may not be of a desired degree of effectiveness; according to the manner in which they are manipulated, and the easy and expeditious removal of enamel depends entirely upon their proper manipulation.

The edge of the cutting blade of the instrument must be placed above the enamel and held at the *proper angle* in its relation to the surface of the root; and a *fulcrum* must be established to facilitate the application and exertion of the necessary force to secure the destruction of what is usually a very dense attachment.

The adjacent teeth, when present, will serve as a means of establishing such a fulcrum; and in their absence the same may often be secured by placing a smooth piece of soft wood or rubber, of sufficient

thickness, against the incisal or occlusal ends of remaining teeth, or the gums, against which the thumb may rest as a means of affording opportunity for securing purchase and leverage.

While various styles of instruments have been suggested for this purpose, those designed by Dr. C. S. Case (Fig. 43) will be found admirably adapted to upper anterior roots; and those designed by Dr. A. G. Johnson (Fig. 44) are especially useful for posterior and lower roots, though adapted for universal use. The manner of holding them in the hand and securing purchase upon adjacent teeth is illustrated in Fig. 45.

After all enamel has been removed, the peripheral trimming of the root should be made smooth, and to present a perpendicular line, as indicated before and after in Fig. 46. This can be easily accomplished with a small fissure bur; or, a set of trimmers, suggested by Dr. J. H. Prothero (Fig. 47), or



Fig. 45.

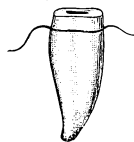
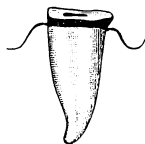


Fig. 46.

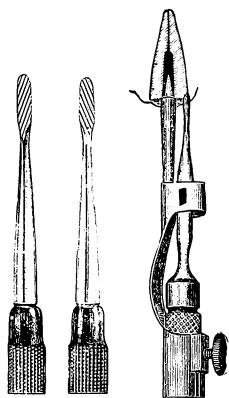


Fig. 47 Fig. 48

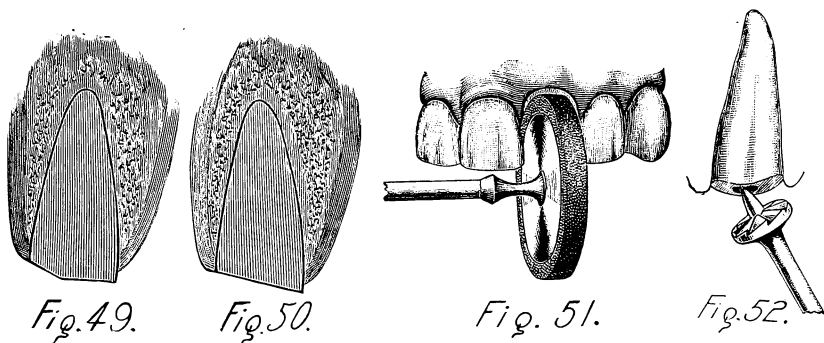
the "Root Reducer," manufactured by the S. S. White Co. (Fig. 48), which are designed for this purpose, may be found useful.

Shaping Basal Surface.

Before considering the final shaping of the end or basal surface of such roots, it may be well to emphasize that they have been *purposely* left projecting somewhat beyond the gum, as indicated, until the peripheral preparation is complete, because of *thus materially facilitating* the removal of enamel, and the subsequent taking of the measurement and fitting of the band, and for the reason that this freely exposed and projecting surplus end serves to retain the wire until an accurate measurement may be secured, and to *conform the band to the proper shape and guide it to place in fitting.*

The fitting of the band is thus made practically free from discomfiture to the patient, and easy for the operator, and after it has been fitted and trimmed to the desired width, the root should *then* be cut down to the proper form of base.

The shape given the basal surface of the root is of much importance, and particularly in the upper anterior teeth, where the requirements make it desirable to leave the lingual edge somewhat longer than the labial in order to afford greater mechanical resistance to the stress naturally imposed, and to carry the labial edge a trifle beneath the gum, so that the band or cap may be *invisible*, and the neck of the porcelain facing placed in close proximity to the gum line.



Compliance with these mechanical and esthetic requirements results, of course, in beveling the end of the root, as indicated in Fig. 49 (which is the common practice), or in shaping it on a slight and gradual *inclined plane*, as illustrated in Fig. 50. The latter is the best and preferable preparation, because of affording greater opportunities for the adaptation of the cap and facing without causing undue prominence at the neck (a common fault with artificial crowns), and with a minimum of grinding of the facing, and a maximum of strength in the crown.

This can be best accomplished with a flat-edge carborundum or "vulcan" carborundum stone (Fig. 51), kept wet when using (the latter having the advantage of wearing true), until the gum line is reached, when the Ottolengui root-facers (Fig. 52) are most useful in cutting it beneath the gum on the labial or buccal edges, without lacerating the tissues. These should be of the "safe-sided" variety, and are made in

three sizes, to accommodate the size of root and the space between adjacent teeth, and should be used with extreme care, as they cut rapidly.

In the preparation of bicuspid and molar roots, where the stress is *direct*, it is usually desirable to leave the basal surface almost *flat*, as indicated in Fig. 53. This allows more opportunity for securing strength in the finished crown, and adds to the possibilities for its closer adaptation and more artistic and esthetic requirements.

In *no instance*, however, should this final preparation be observed *until the band has been fitted*.

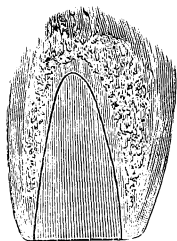


Fig 53.

Preparation for Dowel Crown without Band.

In the preparation of roots for the dowel crown *without* band, the same procedure applies to the removal of the remaining natural crown, as indicated in the preparation for this style of crown with a band.

Requirements. After the remaining portions of the natural crown have been sacrificed, however, the essential features differ somewhat in the shape given to the basal surface, and in that the removal of enamel, or any peripheral preparation, is, of course, entirely unnecessary.

Operative Procedure.

As the permanency and success of such crowns depend, to a great extent, upon the degree of accuracy secured in the adaptation to the root, its end must be so shaped as to render the opportunities for a close adaptation most favorable.

Inseparable Dowels. In the preparation for that style of crown in which the dowel is an integral part (as the Logan crown), the form given to the basal surface should be exactly as indicated before, in Fig. 50, and the procedure is identical, *excepting the removal of enamel*.

This preparation becomes necessary because the presence of an immovable dowel makes the grinding of the crown to adaptation with the root somewhat difficult at best, but which is facilitated, of course, by having the root present as smooth a surface as possible. The labial surface may then be brought in contact with the gum margin, which is desirable for esthetic reasons, while the line of junction upon the lingual surface will be in accord with prophylactic measures in being rendered self-cleansing by exposure to the secretions and movements of the tongue..

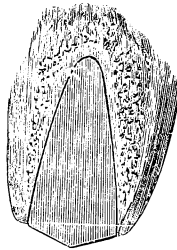


Fig. 54.

Separable Dowels. The difficulty in adapting such crowns because of the interference of the dowel in grinding, constitutes the advantages possessed and afforded by those with separate dowels, such as the Davis crown.

Plate and Dowel. Where it is intended to construct the crown with plate and dowel as separate parts, to be subsequently attached with solder, and where the close adaptation of the plate may be secured by swaging or burnishing, the lingual edge should also be beveled to the gum line. (Fig. 54.)

By thus *saddling* the end of the root, greater mechanical resistance is offered to the displacement of the crown, while the prophylactic requirements are secured in a better adaptation of the surface, and a closer approximation of the edge of the plate to the root.

Protection of Unsupported Walls. In roots which present a concave base as the result of extensive decay, the walls should first be ground down until smooth, and as dense as the marginal outlines noted will admit, and then supported with a suitable material.

When the continuity remains unbroken, cement will best answer the purpose, but if some restoration seems necessary, the use of amalgam is usually indicated for the reasons mentioned.

As mechanical retention is frequently impossible, in these roots, some difficulty may be experienced in anchoring it where its use is indicated, but this may be accomplished by first thoroughly roughening or serrating the dentine with a wheel-bur, and then flowing over it a thin coating of cement and immediately packing the amalgam to place.

The cement thus aids materially in securely anchoring the amalgam, and a more permanent restoration is often afforded.

In very extensive decay these walls may sometimes be better supported by forming the base of the crown itself to closely fit them, so as to offer the necessary protection when mounted with cement.

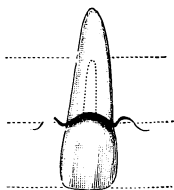


Fig. 55.

Preparation of Canals.

The preparation of the canal for the reception of the dowel should always be the last procedure, and is of special significance since the dowel plays such an important part in the retention and stability of this style of crown.

Requirements. The necessary preparation consists in enlarging them sufficiently to receive a dowel *proportionate in size with the diameter and probable length of the root, and consistent with the requirements of the crown.* Any further enlargement and destruction of tooth structure is injudicious and unnecessary.

One dowel is sufficient to support any crown, *providing* that it may extend into the root a depth *equal* to the length of the crown (Fig. 55), which is a mechanical requirement, and possess strength enough to withstand the stress.

In upper first bicuspid and in molar roots, however, if the probable length or constriction of the root precludes this, two may be used.

Operative Procedure. After first so determining the size of dowel indicated, or to be used, in the individual case, the canal should then be enlarged to receive it. A twist drill or sharp round bur approximating the same diameter of the dowel should then be selected, and the canal reamed out to adequate proportions.

In most instances it is desirable to extend the opening into the canal somewhat to the lingual, in order to permit the dowel to pass through the cap at a point which will carry its projecting and surplus end out of the way, so as not to interfere with the adjustment of the neck of the facing to proper relation.

Considerable care should be exercised, especially in bicuspid and constricted roots, to avoid drilling through the side of the roots, as such perforations usually cause much trouble, and may often result in the loss of the root.

For this reason the round bur is considered the best and safest means of enlarging canals, because if of a proper size, and carefully guarded, as it approaches the periphery an immediate response will be manifested from its approaching proximity to the periodontal membrane, in ample time to cause cessation of drilling and prevent perforation of root.

Treatment of Perforated Roots.

The presentation of perforations through the root, whether from accidental causes or as the result of caries, is usually a most aggravating state of affairs, and calls for much painstaking effort to again place such a root in condition to remain permanently comfortable.

A hermetical and non-irritating seal is required, for which purpose soft gold foil, tin foil, cement and gutta percha are generally used.

While all possess some good qualities, the use of chemically pure tin foil is most universally successful.

When these cases present, all septic and inflamed conditions of immediate and surrounding tissues should first be relieved by the proper medicinal applications. A small cone of chemically pure tin foil, about No. 4 thickness, should then be rolled, and inserted into canal, until one end is passed through the perforation. With a smooth, blunt, root canal plugger, the remaining portion of the cone should be gently packed against the walls over and surrounding the perforation, and then small pellets of slightly moistened cotton should be packed into the canal to burnish the tin to close adaptation.

Upon the removal of the cotton the tin may be protected and held in place by covering with chlora-percha and filling the root with cement.

When such treatment becomes *necessary before* filling the canals, their location may be preserved to admit of same by the insertion of a broach into each, the subsequent removal of which will leave them still accessible for further treatment and final filling, through the openings thus made.

The use of tin is preferable to other materials, because it is easily adapted, even in the presence of moisture, and is absolutely non-irritating, and offers a still greater advantage in the *hermetical* sealing afforded by the subsequent formation of the *oxide*, which chemical action is induced by contact with the moisture of the tissues.

Treatment of Fractured Roots.

The not infrequent presentation of fractured roots, and the difficulties usually encountered in their treatment, requires a definite knowledge of the various means employed to restore and preserve their usefulness, and a delicacy and dexterity of manipulation in the procedure.

In the posterior teeth these conditions usually result from overstrained or undue masticatory force upon such teeth as may have been weakened by the presence of extensive decay, or very large fillings, involving the approximal and occlusal surfaces, and causing a longitudinal fracture of the remaining crown and root.

Such fractures usually extend from mesial to distal surfaces, separating the buccal from the lingual cusps, and may often be successfully treated and permanent usefulness restored by crowning the root.

When such a course seems indicated, the first procedure should be the thorough removal of all loose particles, by freely washing and flooding the tooth with tepid water, until a perfect and close approximation of the parts may be secured.

This approximation should then be securely retained, temporarily, until permanent fixation may be obtained by mechanical means. This may be accomplished by using well annealed German silver, or ordinary silver suture wire, from 23 to 26 g., which should be passed around the circumference of the tooth at the neck, and the ends then twisted tightly together.

The German silver wire is preferable because of admitting of greater strain without breaking, and if therapeutic treatment is necessary it may then proceed until the tooth and adjacent tissues are placed in favorable condition.

The mechanical procedure then necessary to firmly and permanently anchor the parts is governed by the extent of structure possessed by each independent portion.

If enough remains of each portion, they may be securely attached by cutting dovetail grooves in each, and then flowing a thin layer of cement over the entire interior surface, thus utilizing its adhesive properties, and then filling with amalgam. (Fig. 56.)

When the latter has become thoroughly crystallized, the wire may be removed, and the tooth carefully shaped for the reception of the crown. When insufficient structure in one of the parts precludes this procedure, the desired result may be accomplished by first wiring securely, and then adjusting the rubber dam and completely filling the tooth with thin cement.

If the presence of moisture is prevented, the adhesive properties of the cement, in conjunction with the wire around the neck, will usually retain the parts until the tooth has been shaped, if *care* be exercised. In this particular, the stone should *always* revolve toward the fracture in order to prevent displacement.

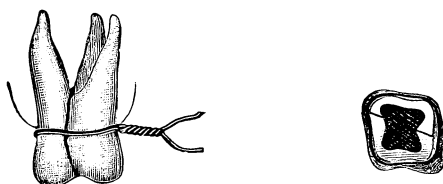


Fig. 56.

The wire may then be removed, and the crown fitted and mounted.

Anterior Teeth. Such fractures in the anterior teeth usually occur as the result of a blow or other accident; or from the stress of mastication upon an artificial crown offering no protection against such strain and perhaps mounted upon a root already weakened by too extensive or injudicious enlarging of the canal for the reception of the dowel.

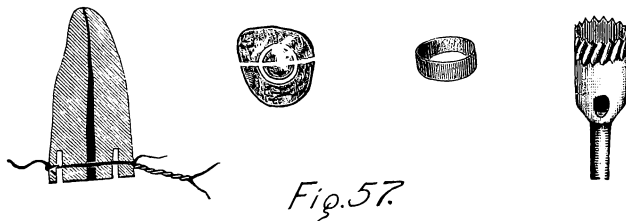
When the fracture does not extend beyond the border of the alveolus to any appreciable extent, it is usually best to remove the loose portion, compress the tissues with gutta percha, and restore with amalgam. Or if the necessary retention is not possible, the base of the crown may be closely adapted to the root, and the restoration made with the crown.

When the fracture extends *beyond* the alveolus, however, it is usually desirable to secure fixation and retain the loosened portion, in order to prevent the resorption following its loss.

This may be accomplished by cementing and wiring until sufficient preparation can be made to admit of the adjustment of the crown.

If each portion possesses sufficient structure, additional strength may often be secured in their fixation by the use of an *interdental band*.

Where the length and thickness of the fractured part may seem to indicate such a procedure, the parts should first be tightly wired, as suggested, and then a circular groove trephined a consistent depth through the thickest part of each, into which a band may be subsequently fitted (Fig. 57), by the use of a very simple outfit suggested by Dr. B. J. Cigrand. When the band has been adjusted to the groove and ground



smooth with the basal surface of the root, a firm secure fixation of the parts is insured, and the wire may then be removed and the crown adjusted.

Prognosis. While some little suppuration and trouble may be present as a result of reuniting fractured roots, it should give no unnecessary apprehension, because if properly treated and absolute immobility secured, it is usually of but temporary nature, and many roots so treated seem permanently restored to usefulness, indicating a very favorable prognosis.





The Four Intermaxillary Bones, Hare-Lip and the Morphological Value of the Upper Incisor Teeth of Men.

By PROF. PAUL ALBRECHT, Doctor in Medicine, Surgery and Accouchement, Doctor in Philosophy.

(Translated from the French by Miss Dorothy K. Pearsall, May, 1901.)

Read before the American Society of Orthodontists, at St. Louis, Mo., June 12, 1901.

In all mammals the upper incisor teeth are imbedded in a particular bone, the *intermaxillary* or *incisor bone*. Galen* was the first to recognize the presence of this bone in man, a discovery not contested until the time of André Vésale. This great reformer of human anatomy showed that the works of Galen were based solely upon dissections of monkeys and dogs and that man did not possess the bone in question.†

This idea of Vésale of the non-existence of the intermaxillary in man existed down to the time of Goethe and of Oken. The former showed that in the double hare-lip the intermaxillaries remained isolated, forming the *bourgeon*, whilst ordinarily they united in good time with the upper jawbones. This theory of Goethe was accepted without opposition until recently. Meanwhile I pointed out in a short notice published in 1879 in the *Zoologischer Anzeiger* that in reality there exist four intermaxillary bones, two on each side of the central plane, and that the cleft of the hare-lip does not pass between the intermaxillary and the upper jaw, but that it is "intra-incisive," or, rather, that it passes between the two intermaxillary bones of one side. The following are the differences between Goethe's theory and mine:

1. According to Goethe's theory, there are two intermaxillaries in man. According to mine there are four.
2. According to Goethe's theory, the *bourgeon* in the double hare-lip is formed by the two intermaxillary bones. According to my theory the *bourgeon* is formed by two internal intermaxillary bones.

*Salenus lib. De Ossibus, Chap. III.

†Vesalius De Humani corporis fabrica lib. 1, Chap. IX.

3. According to Goethe's theory, the cleft of the hare-lip is situated between the intermaxillary bone and the upper jaw. According to my theory the cleft is situated between the internal intermaxillary bone and the external intermaxillary bone.

4. According to the theory of Goethe and his followers, it is impossible that the incisive suture and the cleft of the hare-lip should exist on the same side. According to my theory the thing is quite comprehensible and it is one that always does exist, provided that the incisive suture be not obliterated.

5. According to the embryologists, who admit Goethe's theory, the cleft of the hare-lip corresponds to the cleft between the submaxillary *bourgeon* and the internal nasal *bourgeon*. According to my theory the

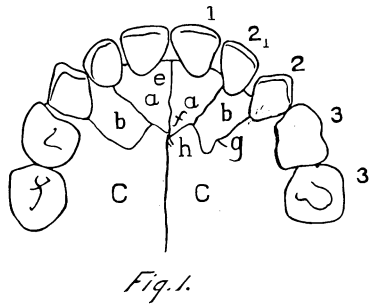


FIG. 1. Albrecht's Theory. The intermaxillary sutures of a child. aa, Endognathion, right and left; bb, Mesognathion, right and left; cc, Exognathion, right and left; e, Interognathic suture; f, Endomesognathic suture; g, Mesoexognathic suture; h, Endoexognathic suture; i, Internal incisor deciduous (central); 1¹, External incisor deciduous (lateral); 2, Canine deciduous; 3, First molar deciduous; 3¹, Second molar deciduous.

cleft of the hare-lip corresponds to the primitive cleft between the internal and external nasal *bourgeon*.

6. According to the embryologists who are followers of Goethe's theory, the internal nasal *bourgeons* form the intermaxillary bones, whilst the submaxillary *bourgeons* give birth to the upper jaw bones. According to my theory the internal nasal *bourgeons* form the internal intermaxillary; the external nasal *bourgeons*, the external intermaxillaries; the submaxillaries, the upper jaw bones.

In the normal state the four intermaxillaries unite between themselves and join with the upper jaw bones, giving birth to a complex system of sutures. In order to be able to designate these sutures conveniently, I used in my work to which I previously alluded, the following Greek names for the three bones that hold the upper teeth in man. I called the

internal intermaxillary bone the endognathion (ἡγναθός, the jaw), the external intermaxillary bone, the mesognathion, and the upper jaw bone, the exognathion.

We have then in Fig. 1;

(1) Between the two internal intermaxillary bones, the interendognathical suture. (Fig. 1, e.)

(2) Between the internal and external intermaxillary, the endomesognathical suture. (Fig. 1, f.)

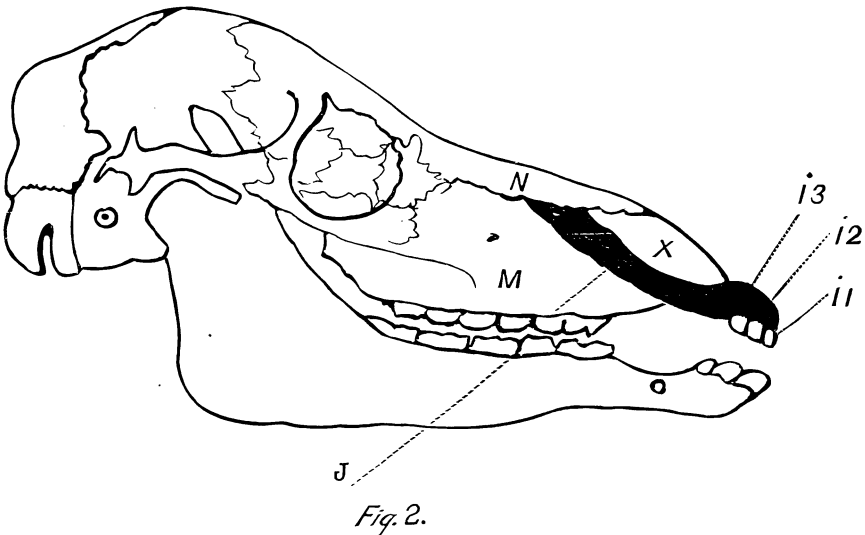


FIG. 2. Diagram of right profile of skull of young normal horse—six incisors. J, Intermaxillary bone. M, Upper jaw. N, Nasal bone. X, Quadrilateral cartilage of the partition of the nose. *i*₁, First upper milk incisor. *i*₂, Second upper milk incisor. *i*₃, Third upper milk incisor.

(3) Between the internal intermaxillary and the upper jaw, the endo-exognathical suture. (Fig. 1, h.)

(4) Between the external intermaxillary bone and the upper jaw, the meso-exognathical suture. (Fig. 1, g.)

(5) Between the two upper jaw bones, the inter-exognathical suture.

In a normal state in man the upper central incisor tooth develops in the internal intermaxillary bone or endognathion, and the upper lateral incisor tooth develops in the external intermaxillary bone or mesognathion.

Recently the son of the great embryologist, A. Von Kölliker, M. Th. Kölliker, published a memoir in which he vehemently contested my theory put forth in 1878, conducing to re-establish Goethe's theory; consequently he accepts two intermaxillary bones only, and maintains that in the hare-lip the cleft of the alveolar apophysis is always between the intermaxillary and the upper jaw.

We have already seen that all mammals possess the intermaxillaries well developed and distinct until adult age, whereas in man, where the face is reduced, they are smaller and united with one another and with the upper jaw, as early as the eighth week of embryonic life. It is clear

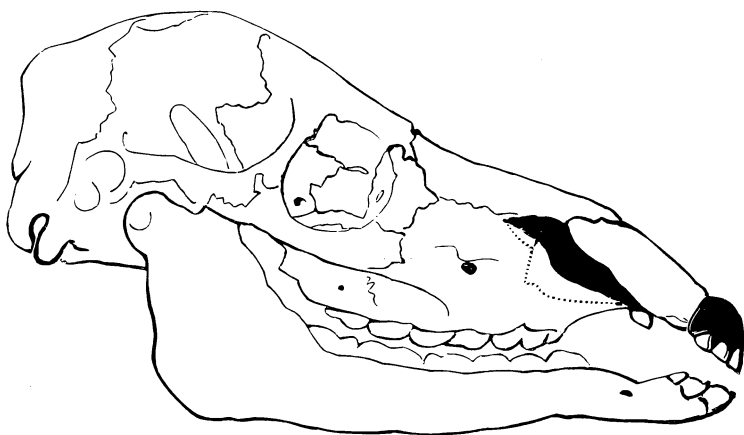


Fig. 3.

FIG. 3. Diagram of the right profile of a young horse affected by double hare-lip—eight upper incisors. J₁, Internal intermaxillary bone. S₁₁, External intermaxillary bone. M, Upper jaw. N, Nasal bone. X, Quadrilateral cartilage of the partition of the nose. i₁, First upper milk incisor. i₂, Second upper milk incisor contained in the internal intermaxillary bone. i₃, Third upper milk incisor. i₄, Fourth upper milk incisor contained in the external intermaxillary bone. X, Mamillary cleft between internal intermaxillary bone and external intermaxillary bone. S, Incisive suture between external intermaxillary bone and upper jaw.

then that it is necessary to begin the study of intermaxillaries in animals in which they are most developed and most distinct. Such for example is the horse, which we shall choose first.

Now by a strange coincidence I found, in 1878, in the skull of a horse affected with double hare-lip, the existence of four incisive bones. I show you here the right diagrammatic profiles of this skull, comparing it with the same profile in the skull of a normal horse. (Fig. 2.)

In the normal horse the intermaxillary bones possess an extensive body and two processes. The one is the palatine process, which, joining to the same organ on the other side, touches the palatine processes of the upper maxillaries. The other, the nasal process, which borders outwardly on the pyriform opening, unites in all its length with the inner edge of the facial surface of the upper jaw, running as far as the nasal bone, with which it also unites.

We have then two sutures with the nasal process; one intermaxillo-submaxillary suture, and one intermaxillo-nasal suture.

It is evident that the intermaxillo-submaxillary suture is nothing but the facial part of the incisive suture of the human anatomy.

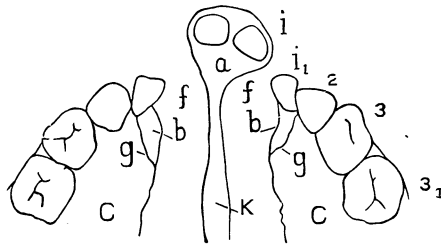


Fig. 4.

FIG. 4. Diagram of the double hare-lip in man, with double palatine cleft. a, The two internal intermaxillary bones joined together on the medium line (endognathion, right and left). bb, The two external intermaxillary bones (mesognathion, right and left). cc, The two upper maxillary bones (exognathion, right and left). ff, Lateral maxillary clefts between the internal intermaxillary bone and the external intermaxillary bone (endomesognathic fissure). gg, The two incisive sutures between the external intermaxillary bone and the upper jaw (mesoexognathic suture). k, Vomer. 1, Internal incisive milk tooth. 1^a, External incisive milk tooth. 2, Canine milk tooth. 3, First molar milk tooth. 3^a, Second molar milk tooth.

Each intermaxillary bone in the horse carries three incisive teeth, two of which are lodged in the body and one where the nasal process takes its origin.

This being admitted, we shall proceed to the examination of the hare-lip of the horse.

I had the chance of finding in the teratological collection of the Anatomical Institute of the University of Königsberg a horse's skull with a double hare-lip. (Fig. 3.)

As at that time I still shared the theories generally taught, I was very much surprised at not finding the cleft of the hare-lip between the intermaxillaries and the upper jaw, but between the body of the intermaxillary and its nasal process.

In fact, we see when we look at the right diagrammatic profile of this horse, the nasal process uniting exactly as it does in the normal horse, with the upper jaw.

We find then in this case the intermaxillo-supramaxillary suture, and at the same time on the same side of the skull the cleft of the hare-lip.

This suture, counting from the point where the nasal apophysis of the intermaxillary, the upper jaw and the nasal bone touch each other, to its lower extremity, measuring on the left eighty millimetres, on the right seventy-nine millimetres.

The cleft between the nasal process and the body of the intermaxillary, measuring from the palatine surface of these organs, is on the left eleven millimetres, on the right twenty millimetres.

It is then incontestable that we have here on both sides of the skull a co-existence of the intermaxillo-supramaxillary suture, or incisive suture and the cleft of the hare-lip.

Since M. Th. Kölliker says that the co-existence on the same side of the incisive suture with the lateral maxillary cleft never takes place, I can only regret with him that he has not been so lucky as myself in his researches. I say this with all the greater certainty because the co-existence of these two organs is altogether incontestable in the horse's skull, and especially because these organs leave nothing to be desired when considering their microscopic dimensions, the incisive sutures measuring, I repeat, on the right side seventy-nine millimetres, on the left eighty millimetres.

There is no doubt that the part of the intermaxillary situated laterally to the cleft and which borders on the outside of the pyriform opening is our external intermaxillary, the mesognathion. This external intermaxillary has on the left a fourth incisive tooth, that is to say, a supernumerary tooth, since the body carries three on each side.

On the right this incisive tooth does not take root in the bone but is situated immediately below it, implanted in the dry mucous.

On the internal side of the cleft we find the two internal intermaxillary bones (endognathia) united to the facial side, but still joined by suture to the palatine face.

These two internal intermaxillary bones carry together six incisive teeth, three on each side.

The two first are well placed. The second and third have an abnormal direction, especially the second on the right, whose cutting edge points outwards. This tooth has suffered a rotation of 90° round the axis of its root, then has righted itself from 90° .

We have here then eight incisive upper teeth, a rare thing in the horse.

The explanation of the morphological value of these teeth will be given to us hereafter by two extremely remarkable skulls preserved in the collection of the Anato-mo-Pathological Society of Brussels.

Let us now pass to the hare-lip in man. Generally the double hare-lip in man presents itself under the form of this diagram. (Fig. 4.)

This diagram, which I take from my before-mentioned work, was made in 1878 from the skull of a child here given. When looking at this diagram, we have in the middle the vomer very elongated in front and bearing anteriorly a bone which contains two incisive milk teeth.

Latterly, with reference to the cleft, we find four teeth at each side in their alveoli: the two molars, the canine and an incisive milk tooth.

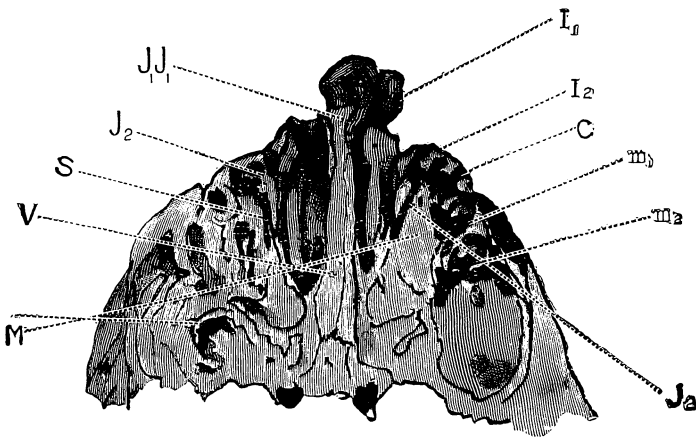


Fig. 5.

FIG. 5. Lingual view of the anterior part of the skull of a new-born child affected by double palato-maxillary cleft—four upper incisors. JJ, The two internal intermaxillaries joined at the middle line. J¹, Left external intermaxillary bone. M, Left upper jaw. V, Vomer. I₁, Upper internal incisor (milk dentition). I₂, Upper external incisor (milk dentition). C, Upper external canine (milk dentition). M₁, First upper molar (milk dentition). M₂, Second upper molar (milk dentition). S, Right incisive suture (milk dentition). On each side between the external intermaxillary bone and the upper jaw: the incisive suture. On each side between the internal intermaxillary bone and the external intermaxillary bone: the cleft of the hare-lip.

The cleft is then between the middle incisor tooth and the lateral incisor tooth. The piece which contains the lateral incisor is still separated by a suture very easily seen on the palatine face. There is no doubt that this suture is the seam between the upper jaw and the outer intermaxillary, and that the bone from the upper jaw is the external intermaxillary, whilst the bone which carries the two middle incisors shows us the two internal intermaxillaries joined. If we look now at the skull of a child itself (Fig. 5), we see the proof of what we have shown in our diagram. To the right and left we see the co-existence of the endo-mesognathic cleft of the hare-lip between the internal intermaxillary and the external inter-

maxillary, and of the meso-exognathic or incisive suture between the external intermaxillary bone and the upper jaw. Here is again proven in man the co-existence on the same side of the cleft of the hare-lip and the incisive suture.

In the case of the unilateral hare-lip in man we have on one side alone what we have just verified with two sides. This is what the skull (which I pass round now) shows very clearly. (See Fig. 6.)

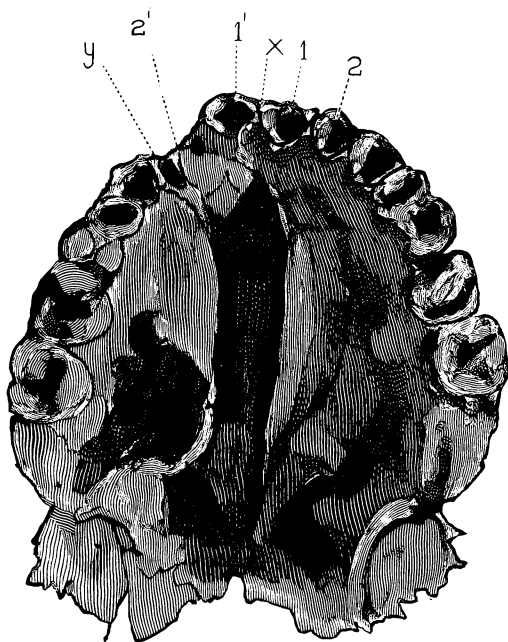


Fig. 6.

FIG. 6. Lingual view of the palate of an adult affected by a hare-lip and of right unilateral palatine fissure, (belonging to the Kiel University). 1, Socket of the left internal incisor. 2, Socket of the left external incisor. 1', Socket of the right internal incisor. 2', Socket of the right external incisor. Between 1' and 2' the maxillary cleft is seen. X, Suture between the two internal intermaxillary bones (interendognathic suture). Y, Suture between the right external intermaxillary bone and the right upper jaw (incisive or right mesoexognathic suture).

I owe this remarkable skull to the kindness of Professor Flemming, Director of the Anatomical Institute at Kiel. It comes from an adult man having a hare-lip and a cleft palate on the same side. On account of the hare-lip and the unilateral palatine cleft there were distortions in the long face of this man.

1. The vomer bends very much to the left to form with the palatine apophysis of the upper jaw and of the left palatine bone, the left nasal cavity.

2. The right internal Eustachian tube and the right bony palate descend much lower than the same parts on the left.

The cleft of the hare-lip is, as one can see, between the alveolus of the right internal incisor and the alveolus of the external incisor on the same side.

Then come the alveoli of the right canine, the two premolars and the two first right molars, whilst the right wisdom tooth has been lost during life and its alveolus is reabsorbed.

To the left we have the alveoli of the internal incisor, the external incisor, the canine, the two premolars and the two molars; the wisdom tooth and its alveolus have undergone the same process as the one on the right side.

Between the sockets of the right external incisor and the canine we observe a suture on the palatine surface.

It is evidently the incisive suture between the right external intermaxillary and the right upper jaw, or the meso-exognathic suture. We are then again in the presence of the co-existence of the incisive suture and of the hare-lipped fissure so energetically contested by Th. Kölliker.

The right internal intermaxillary bone which carries the socket of the right incisor is united at the median line with the left internal intermaxillary by a suture which still leaves it a certain mobility. *We have thus here the case of an endognathion (right bone) entirely isolated.* The inter-endognathic suture which is obliterated so rapidly in the double hare-lips has remained open in this adult with the unilateral hare-lip.

I am happy not only to be able to show the presence of an isolated maxillary bone in the skull at Kiel, but I can again add that there is a case in literature in which the external intermaxillary bone of each side was isolated from the upper jaw. This was the case of Mr. J. F. Meckel.

If one wishes to judge the considerable and disastrous effect exercised by the theory of Goethe on the minds of our best anatomists and surgeons, it is enough to compare the figures and text of the eminent German surgeon, Mr. Koenig. If we take the second edition of his *Manual of Special Surgery* we read (p. 243) the following sentence:

"The simple maxillary fissure *always* passes between the incisor and the canine corresponding to the place of foetal reunion of the intermaxillary with the side parts."

This sentence is accompanied by two figures after M. Von Bruns (Nos. 47 and 48), which show the plainest discordance between M. Koenig's text and his illustrations.

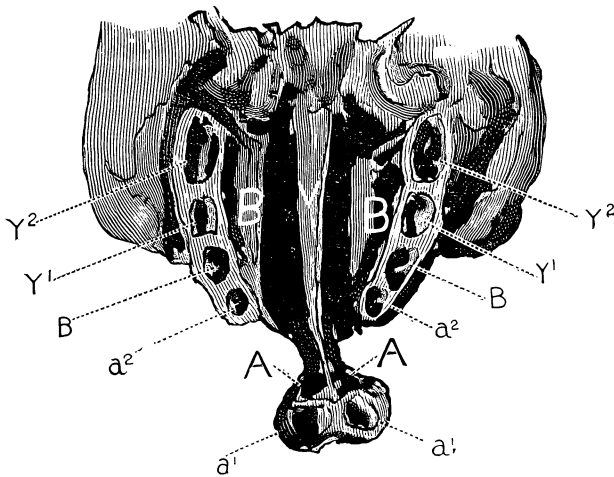


Fig. 7.

FIG. 7. Analysis of Fig. 48, page 244, Vol. 1, of the Second Edition of the *Manual of Special Surgery*, by M. Koenig (double hare-lip in a child after M. Von Bruns). a¹a¹, Sockets of internal milk incisors (centrals). a¹a², Sockets of external milk incisors (laterals). BB, Sockets of milk canines. Y¹Y¹, Sockets of first milk molars. Y²Y², Sockets of second milk molars. V, Vomer. BB, Upper maxillaries joined to external intermaxillary bone.

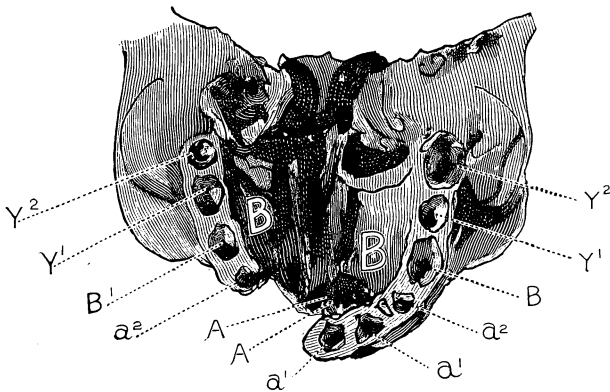


Fig. 8.

FIG. 8. Analysis of Fig. 47, page 243, Vol. 1, of the Second Edition of the *Special Surgery Manual*, by M. Koenig (left unilateral hare-lip of a child, after M. Von Bruns). a¹a¹, Sockets of internal milk incisors (centrals). a¹a², Sockets of external milk incisors (laterals). BB, Sockets of milk canines. Y¹Y¹, Sockets of first milk molars. Y²Y², sockets of second milk molars. BB, Upper maxillaries and joined external intermaxillary bones. AA, Internal intermaxillary bones. The interendognathic and the right endomesognathic sutures are still plainly visible.

In fact in the single hare-lip (Fig. 47) as well as in the double hare-lip (Fig. 48), the cleft does not pass between the incisors and the canine, but between the two incisors.

It is evident that the first tooth situated outside of the cleft is not the canine, as Mr. Koenig believes, but the external incisors—you can judge and suit yourselves. I show these figures, Nos. 7 and 8.

It can be seen from the just mentioned examples how much the

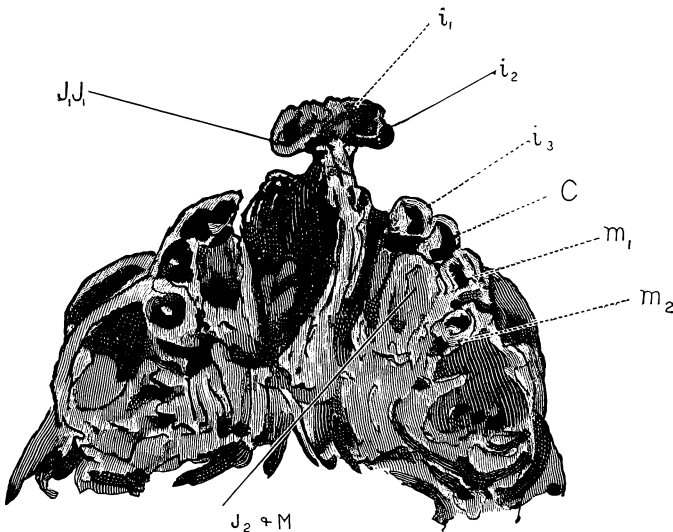


Fig. 9.

FIG. 9. Lingual view of the anterior part of the skull of a child affected by double palato-maxillary cleft—six upper incisors (belonging to the collection of the Anatomico-Pathological Society at Brussels). J_1J_1 . The two internal intermaxillary bones joined at the middle line. J_1M , Left upper jaw joined to left external intermaxillary bone. V . Vomer. i_1 , Upper parasympphysian milk incisor contained in the internal intermaxillary bones. i_{11} , Upper parasympphysian milk incisor contained in the internal intermaxillary bone. i_{111} , Upper milk pre-canine contained in the external intermaxillary bone. C , Upper external canine (milk dentition). M , First upper molar (milk dentition). M_2 , Second upper molar (milk dentition).

Goethe theory has been rooted in the most cultivated minds. Mr. Th. Kölliker says in his before-mentioned work, page 364, "My theory reposes on two supports which he believes to have destroyed: 1. The co-existence of the incisive suture with the lateral maxillary fissure. 2. The dependence in which the teeth are found opposite the bones."

Concerning the co-existence of the incisive suture with the external cleft I leave the care of deciding who, Mr. Kölliker or I, is right, to those competent to judge. We have proved this co-existence of the two

sides in the skull of the horse (Fig. 4), and in man (Fig. 5), on one side only in the unilateral hare-lip of Kiel (Fig. 6). As to the horse, the co-existent incisive suture did not measure less than seventy-nine millimetres on the right and eighty millimetres on the left. In human skulls, if not as large, it was at least as distinct.

Now as to what concerns the dependence of the teeth with reference to the bones in which they are planted, I maintain the opinion which I laid out in my preceding work, Mr. Kölliker, in my opinion, having done absolutely nothing to prove the independence of the dentition with regard to the bones which sustain it.

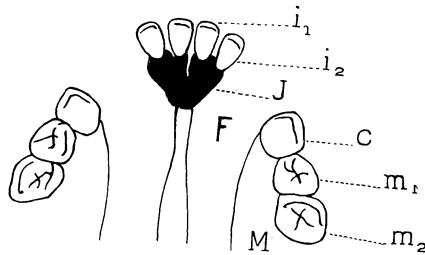


Fig. 10.

FIG. 10. Diagram representing the ancient theory of hare-lips, which maintains that the hare-lip cleft passes between the "intermaxillary" bone and the upper jaw. As according to this theory, the incisors (i_1, i_2) are situated in the "intermaxillary" bone (J), the hare-lip cleft (F) separates the "intermaxillary" (J) from the upper jaw (M). J_1 , Left internal intermaxillary bone (left endognathion). J_{11} , Left external intermaxillary bone (left mesognathion). M, Upper jaw (left)—(exognathion left). i_1 , Internal upper milk incisor. i_2 , External upper milk incisor. i_{11} , Proparasymphysian upper milk incisor. i_{111} , Pre-canine upper milk incisor. C, Upper milk canine. M_1 , First upper molar. M_2 , Second upper milk molar.

I shall, however, communicate the very interesting conclusions in regard to dentition to which I have been led by the examination of two precious preparations belonging to the Anatomy and Pathology Society of Brussels. I seize this opportunity to express my best thanks to Mr. Thiry, President of this Society, for the permission which he kindly granted me to examine them and have them reproduced.

In these skulls we establish the presence of four milk incisors in the *bourgeon*, and again an upper incisor on each side of the hare-lip cleft. We have thus here six incisors.

One of the skulls (see Fig. 9) shows us the crowns of four milk incisors which are not yet quite erupted in the *bourgeon* and a third milk incisor on each side of the cleft well erupted. On this skull the incisive sutures are no longer seen.

In the figures I have represented, the ordinary double hare-lip with four incisors (Fig. 11), and the same affection, but with six incisors (Fig. 13).

The following are the distinguishing features of these two cases :

In the double hare-lip with four incisors, each of the four intermaxillary bones carries an incisor. In the double hare-lip with six incisors, the two internal intermaxillary bones each carry two incisors, and the two external intermaxillary bones each one incisor.

Thus the two cases have this in common, that the *external* intermaxillary bone always carries only one incisor. As the external inter-

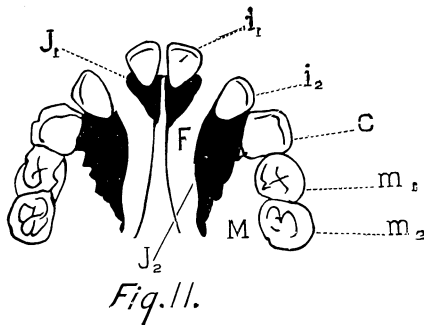


FIG. 11. Diagram representing my theory of double hare-lips with four incisors, theory emitted in 1878. The hare-lip cleft (F) passes on each side between the internal intermaxillary bone (J_1) and the external intermaxillary bone (J_2); it co-exists on each side with the incisive suture (S), which is situated between the external intermaxillary bone (J_2) and the upper jaw (M). The internal intermaxillary bone (J_1) bears on each side the internal incisor (i_1); the external intermaxillary bone (J_2) bears the external incisive (i_2). J_1 , Left internal intermaxillary bone (left endognathion). J_2 , Left external intermaxillary bone (left mesognathion). M, Upper jaw (left)—(exognathion left). i_1 , Internal upper milk incisor. i_2 , External upper milk incisor. i_1 , Parasympphysian upper milk incisor. i_2 , Proparasympphysian upper milk incisor. i_{11} , Pre-canine upper milk incisor. C, Upper milk canine. M_1 , First upper milk molar. M_2 , Second upper milk molar.

maxillary bone of the hare-lip with four incisors is the homologue of the external intermaxillary bone of the hare-lip with six incisors, it is certain that the incisors which they contain on either side are also homologous. In both cases these incisors are situated in front of the canine and separated from them by the incisive or meso-exognathic suture.

We shall designate this incisor placed immediately in front of the canine by the name of *pre-canine*. The pre-canines are always situated in the external intermaxillary bones.

What is the homology of the incisors contained in the internal intermaxillaries?

Here is presented a difficulty. In fact in the case of the hare-lip with four incisors the internal intermaxillary carries only one incisor,

whilst in the case of the hare-lip with six incisors the same bone carries two of them. But on reflection it is evident that in the hare-lip with six incisors the incisor situated nearest to the median line, that is, the most internal of the two incisors contained in the internal intermaxillary, is homologous to the solitary tooth situated in the internal intermaxillary of the hare-lip with four incisors. We shall call the incisor nearest the median line, or symphysis, of the internal intermaxillary bones, the incisor *parasymphysis*.

The parasymphysian incisors are thus homologous.

The external tooth contained in the internal intermaxillary bone of the hare-lip with six teeth, which I propose to call the *proparasymphysian*, finds no homologue in the hare-lip with four teeth.

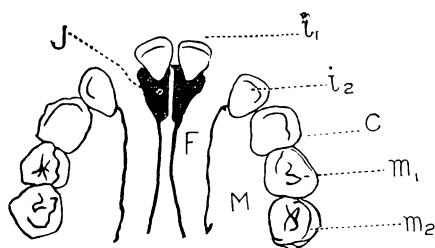


Fig. 12.

FIG. 12. Diagram representing Mr. Th. Kölliker's explanation of hare-lips with four incisors, with one incisor on each side inside and one outside the cleft.

According to this theory, the cleft (F) is, nevertheless, situated between the "intermaxillary" bone (J) and the upper jaw (M), the internal incisor (i_2) being only planted in the upper jaw (M). J, Left internal intermaxillary bone (left endognathion). J, Left external intermaxillary bone (left mesognathion). M, Upper jaw (left)—(exognathion left). i_1 , Internal upper milk incisor. i_2 , External upper milk incisor. i_1 , Parasymphysian upper milk incisor. i_{11} , Proparasymphysian upper milk incisor. i_{111} , Pre-canine upper milk incisor. C, Upper milk canine. M_1 , First upper milk molar. M_2 , Second upper milk molar.

In the hare-lip with four teeth the parasymphysian is that first incisor; the pre-canine the second.

In the hare-lip with six teeth the parasymphysian is the first incisor and the pre-canine the third.

The theory which I have already established of the morphological value of the upper incisor of the normal man is as follows:

The upper internal incisor, or upper parasymphysian, is in reality the first incisor.

The external upper incisor, or second upper incisor of normal man (upper pre-canine) is in reality *the third incisor*.

The true upper second incisor no longer develops in the normal state, but in the case of the hare-lip with six upper incisors it reappears. This reappearance of the second upper incisor is, according to me, atavic. This tooth being phylogenetically and ontogenetically lost can reappear by atavism in the case of the hare-lip. One can wonder what the cause of this reappearance is. This cause ought to be sought for in the favorable nutrition which the internal intermaxillary bones possess in the case of the hare-lip.

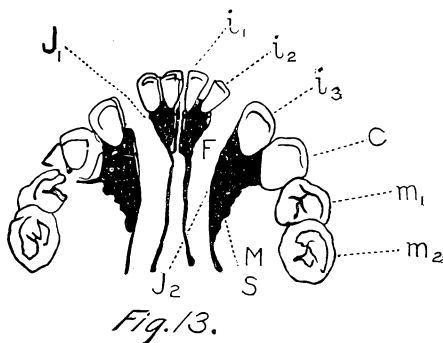


FIG. 13. Diagram representing my theory of double hare-lips with six incisors; the hare-lip cleft (F) passes on each side between the internal intermaxillary bone (J_1) and the external intermaxillary bone (J_2); it co-exists on each side with the incisive suture (S), which is situated between the external intermaxillary bone (J_2) and the upper jaw (M). The internal intermaxillary bone (J_1) on each side bears two incisors; the parasymphysian (i_1) and the proparasymphysian (i_2); the external intermaxillary bone (J_2) bears an incisor, the pre-canine (i_3) and the proparasymphysian (i_4). J_1 , Left internal intermaxillary bone (left endognathion). J_2 , Left external intermaxillary bone (left mesognathion). M, Upper jaw (left)—(exognathion left). i_1 , Internal upper milk incisor. i_2 , External upper milk incisor. i_3 , Parasymphysian upper milk incisor. i_4 , Proparasymphysian upper milk incisor. i_{11} , Pre-canine upper milk incisor. C, Upper milk canine. M_1 , First upper milk molar. M_2 , Second upper milk molar.

To point out what I have remarked and what is well-known to surgeons, that in the double hare-lip combined with the double palatine cleft (*gnatho-uranoschisis duplex*) the vomer developing much more than in the normal state, becomes a bone of great hardness and pushes strongly in front, forming in this manner a prominence to the *bourgeon* formed by the two internal intermaxillary bones. This is the cause of a very great difficulty for the surgical operation of this defect of conformation.

Mr. W. Voolik, in his excellent "Handboek der Ziektekundige outleedkunde," has been the first to perceive the cause of the enormous pre-eminence of the "intermaxillary in the double gnatho-uranoschisis." He attributes it to the independence of the intermaxillary bone in this monstrosity, since it is not retained by sutures with the upper maxillary bones.

I am able to correct and amplify this theory from the excellent source of Voolik. First in the double hare-lip with the double palatine cleft, the vomer not being arrested by sutures with the palatine processes of the upper jaw, and the internal intermaxillary bones not being arrested by sutures with the external intermaxillary bones, the vomer and the internal intermaxillary bones develop towards the *locus minoris resistentiae*, i. e., in front. In this growth we see precisely the same causes and the same effects as in the growth of the incisors of the rodents, when by chance one or the other of these incisors does not develop or is broken, as in the cases of cyclopean monstrosities of mammals, when by compli-

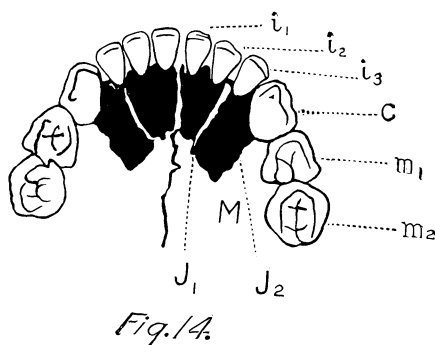


FIG. 14. Representing my theory on the dentition of our hexaprotodont ancestors. A milk dentition has been drawn to facilitate the comparison with others. J, Left internal intermaxillary bone (left endognathion). J, Left external intermaxillary bone (left mesognathion). M, Upper jaw (left)—(exognathion left). i₁, Internal upper milk incisor. i₂, External upper milk incisor. i₃, Parasymphysian upper milk incisor. i₁₁, Proparasymphysian upper milk incisor. i₁₁₁, Pre-canine upper milk incisor. C, Upper milk canine. M₁, First upper milk molar. M₂, Second upper milk molar. The parasymphysian (i₃) and the proparasymphysian (i₁₁) are situated in the internal intermaxillary bone (S), the pre-canine (i₁₁₁) in the external intermaxillary bone (J₁₁).

cation the upper jaws and the intermaxillary become rudimentary (micrognathia superior), and the lower jaw curves strongly upwards (campylognathic infeneure).

In the simple gnatho-uranoschisis the vomer and the two internal intermaxillary bones possess only on the side of the hare-lip and of the palatine cleft the liberty which is given to them on both sides in the double palato-maxillary cleft, whilst on the opposite side they are retained by the sutures with the palatine, the upper jaw and the external intermaxillary bone. The effect of this unilateral independence is not as great as in the case of the bilateral independence, but it is still rather marked.

I have explained why in the double palato-maxillary cleft, the vomer pushes in advance so strongly, but I have not yet spoken of the causes

which produce in the same case the great development of its bony substance and its great hardness.

This is my theory with regard to this phenomena.

In the double hare-lip with double palatine clefts, the arteries which nourish the vomer and the two internal intermaxillary bones do not anastomose directly with the arteries of the upper jaws and external intermaxillaries.

This is why the vomer and the internal intermaxillaries generally become so large in this defect of conformation. I go still further. By

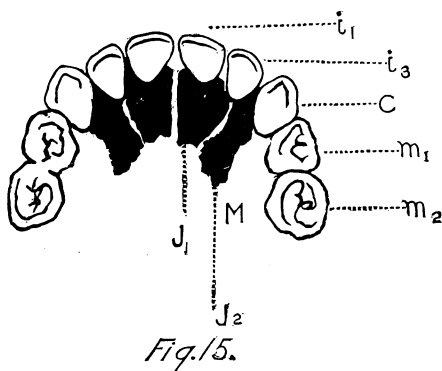


FIG. 15. Diagram representing the morphological value of the upper incisors of actual normal man. The parasymphysis or the true second incisor being lost, there only remains the parasymphysis (i_1) contained in the internal intermaxillary bone (J_1) and the pre-canine (i_{111}) contained in the external intermaxillary bone (J_{11}).

The pre-canine or the mesognathic incisor, generally called in man external incisor or second upper incisor, is thus in reality our third upper incisor.

J_1 , Left internal intermaxillary bone (left endognathion). J_{11} , Left external intermaxillary bone (left mesognathion). M, Upper jaw (left)—(exognathion left). i_1 , Internal upper milk incisor. i_2 , External upper milk incisor. i_1 , Parasymphysis upper milk incisor. i_{111} , Proparasymphysis milk incisor. i_{111} , Pre-canine upper milk incisor. C, Upper milk canine. M_1 , First upper milk molar. M_2 , Second upper milk molar.

this enormous growth of nourishment in the internal intermaxillary bones teeth can develop atavically that in the normal state no longer develop in these bones because they lack nourishment and space. To explain this it is necessary to admit what is shown elsewhere, that man descends from beings which were no more than tetradonts, i. e., after the nomenclature of the celebrated anatomist Owen, that they descend from beings who had only four incisors in their intermaxillary bones. Well, in the skulls at the Brussels University we have a hexaprotodont, we have six incisors in the maxillaries, two in each internal intermaxillary bone and one in each external intermaxillary bone.

Normal man possesses the two parasymphysians and the two pre-canines of these six incisors. The two second incisors, or pro-parasymphysians of the Brussels skulls, he no longer possesses. This incisor is then, according to my theory, an atavical tooth developed in these skulls by excess of nourishment and space which the two internal intermaxillary bones possess, following the double gnatho-uranoschisis. Thus, if in the hexaprotodont skulls at Brussels the parasymphysian is the first, the proparasymphysian the second, and the pre-canine the third incisor *in the normal skull, the parasymphysian has also the morphological value of the first and pre-canine, that of the third incisors.*

Thus between our first and our second upper incisors there is an incisor lost, the *true* second upper incisor.

Let us now look at our diagrams, see Figs. 10, 11, 12, 13, 14 and 15.

Fig. 10 represents the ancient theory of hare-lips: the "intermaxillary bone" bears these incisors; it is separated from the upper jaw by the maxillary cleft.

Fig. 11 represents my theory of double hare-lips with four incisors, theory published in 1878: the internal intermaxillary bone on each side bears the internal incisor, the external intermaxillary on each side, the external incisor. The maxillary cleft does not separate the upper jaw from the intermaxillary, but the external intermaxillary bone from the internal maxillary bone. On each side the co-existence of the maxillary cleft (endo-mesognathic) with the incisive suture (meso-exognathic) is seen.

Fig. 12 represents the explanation of Mr. Th. Kölliker of the double hare-lip: the cleft passes on each side between the internal incisor and the external incisor. According to his theory the cleft separates even in this case the "intermaxillary" from the upper jaw; only by "the independence of the formation of the teeth and of the formation of the bone" the external incisor is placed in the upper jaw.

Fig. 13 represents my theory of the double hare-lip with six incisors. The internal intermaxillary bone on each side bears two incisors, the *parasymphysian* and the *proparasymphysian*; the external intermaxillary bone on each side bears one incisor, the pre-canine. The cleft is between the internal intermaxillary bone and the external intermaxillary bone.

Fig. 14 represents my theory of the dentition of our hexaprotodont ancestors who had the parasymphysian and the proparasymphysian in the internal intermaxillary bone and the pre-canine in the external intermaxillary bone. I have had a milk dentition drawn to facilitate the comparison with the other diagrams.

The last gives the morphological value of the upper teeth of the actual normal man who has lost the proparasymphysian and

who has only the parasymphysian left in this internal intermaxillary bone and the pre-canine in his external intermaxillary bone. After the loss of the true second incisor, or proparasymphysian, the pre-canine has become the pseudo second incisor in actual normal man.

What renders my theory of the morphological value of our second incisors still more likely is that almost the same processes have been proved in horses and rabbits; their upper anterior incisors are the first and the posterior the third, the second having been lost during the ontogenic development.

As to what concerns the horse with double hare-lip, we have seen that it is octoprotodont, while the normal horse is only hexaprotodont. What I have said referring to man can be applied *mutatis mutandis* to the horse. The horse descends from ancestors who had a larger number of upper teeth than it has. I recall here that there are still actually marsupials which are decaprotodonts (e. g., Piramels, Didelphys). In the double hare-lip of the horse the internal intermaxillaries each bear three incisors, while in the normal state they only develop two incisors. The external intermaxillary bone presents to us in these two cases one incisor—the pre-canine. It is thus evident that in the horse the excess of nourishment and space in which the internal intermaxillary bones rejoice in the double hare-lip has also favored the development of a supernumerary atavic incisor in these bones.

We can thus resume the cases of hyperodonty in the cases of hare-lips of horses and men in the following theory:

In the phylogenic development of mammals with two and more than two upper incisors on each side of the symphysis, incisors and pre-canines are constant, while the incisors situated between these two teeth no longer develop. In all these mammals the pre-canine is the incisor of the external intermaxillary bone, or the mesognathic incisor, while the incisors which disappear are all placed by the side of the parasymphysian in the internal intermaxillary bone, or the endognathion of mammals.

If one takes the hexaprotodont ancestors which are nearest man in point of departure, the pre-canine or the external incisor of actual normal man is certainly not the second, but the third, incisor. But if we now extend our theory to the pro-mammals, of which the number of upper incisors is not known, we can say that the external incisor or pre-canine of actual normal is the n th upper incisor of the pro-mammal, in designating the number of upper incisors in the intermaxillary bones on one side of the pro-mammal by n .

Resume.

I sum up the points briefly on which my paper has turned.

1. There are four intermaxillary bones, two internals, two externals.
2. The bud (*bourgeon* or *Bürzel*) in the double hare-lip is formed by the two internal intermaxillary bones.
3. The maxillary cleft in mammals is always situated between the internal intermaxillary bone and the external intermaxillary bone and not between the external intermaxillary bone and the upper jaw.
4. The co-existence of the maxillary cleft and the incisive suture on the same side is incontestably proven by a horse's skull and two skulls of men which have passed through my hands, and by the skull of a man described by J. F. Meckel. (Pathol. Anatomy, p. 540.)
5. When there are three incisors on one side, two of the incisors are placed in the internal intermaxillary bone, one in the external intermaxillary bone; the cleft passes in such a case always between the internal intermaxillary and the external intermaxillary.
6. The upper external incisor of normal man is in truth his third incisor, since a tooth which is situated between the upper internal incisor and the external upper incisor has disappeared during phylogenic development.
7. This true second incisor can make its reappearance in skulls by the maxillary cleft. In this case it is the most external of the two incisors lodged in the internal intermaxillary bone.
8. This atavic reappearance of a tooth which no longer develops in normal man finds its explanation in the excess of nourishment and space in which the internal intermaxillary bone rejoices on the side of the maxillary cleft.

It is very agreeable for me, in conclusion, to express my feeling of profound gratitude to Messrs. Dollo, Fleming, Héger, Houge, Jacques, Schwaller, and Thiry who have been so kind as to place at my disposal preparations which are in their hands, and to aid me in the publication of this paper.

Report of the Foreign Relations Committee of the National Association of Dental Faculties for the Year 1900-1901.*

(Reported and adopted at the eighteenth annual meeting held in Milwaukee, Wis., August, 1901.)

The past year has been an exceedingly active one for the Foreign Relations Committee, and the correspondence has been very large. We believe that the influence of the National Association of Dental Faculties has been materially extended during the year, and the good work that has been accomplished by it is becoming more widely known, both at home and abroad.

The association has given its Foreign Relations Committee jurisdiction in all foreign educational affairs that affect its interests. This we do not understand to mean that we can dictate what shall be the foreign policy to be followed, but that the committee may advise during the interim between the sessions, reporting its action for approval or disapproval at each annual meeting. This does not in any way interfere with the duties of the Ad Interim Committee, as the authority of the latter has never embraced matters in foreign countries. At the last annual meeting the committee presented a partial schedule of equivalents to be given for attendance on foreign courses of study. The association accepted that and enacted that advanced standing in American schools should only be given foreign students in accordance therewith.

There is a rule of the association that any legislation vitally affecting the members shall not go into effect for one year. This is a wise restriction, for the announcements are usually issued before the time of our annual meeting, and enactments that might be in conflict with the terms legally offered to students could not well be enforced. Your committee found that some foreign students had already been accepted by schools, and consideration given to foreign instruction which might be in conflict with the new regulations. It was therefore deemed best not to give any rulings affecting the annual term for 1900-1901.

But many loyal schools, those whose governors were most anxious to improve the standard of American professional education, have referred all their foreign applications to the committee. In this way it has been learned that foreign students have asked for advanced standing because of attendance, in some instances, on schools that had no existence whatever. Certificates have been presented from countries which have no dental legislation, and in which there is no semblance of a dental educational institution. They usually emanate from some private practitioner

*Copy supplied by courtesy of the *Dental Cosmos*.

whose office is made to assume a sounding title. In other cases they pretend to be granted by some teaching hospital which has no official status.

Your committee has discovered that it is usual for the possessors of such doubtful credentials to write to a considerable number of schools to learn which, if any, will accept their certificates, and to find out whether some institution will not offer a special inducement. Each dean is assured that others will receive the applicant if he does not. The result is that all of those to whom application has been made are duly informed of the qualifications of suspected students and the probable terms on which they were accepted if the name is found on the lists of any school.

By this it is readily perceived how deans of colleges have been deceived in the past, and how the character of our American schools has been made to suffer for things over which they had no control. The Foreign Relations Committee is prepared to recommend a rating for any foreign school that will submit its curriculum of study and its preliminary requirements of education. This must be approved by the association before becoming effective, and if our schools will govern themselves accordingly the old reproach that we give advanced standing on insufficient qualifications will be forever removed.

A very few schools have manifested some opposition to these regulations. Your committee has, even by some inconsiderate teachers, been accused of an attempt to dominate the colleges. We cannot conceive upon what grounds such a charge should be brought. The committee has done nothing save that which it was positively instructed to do. It has made no rules whatever. It has confined itself to recommending such legislation as it believed absolutely essential to the proper conduct of an educational institution, and if such recommendations have been given legislative enactment, it has tried to carry them into effect, but not otherwise. It has never exceeded its authority nor been unnecessarily aggressive in any of its proceedings. If there exists any reason for criticism of its action on other grounds than opposition to wholesome restraint and the desire to do that which of right ought not to be done, it will be very glad to have such instances pointed out, for its sole ambition has been to carry out the honest wishes of the parent body to which it is responsible.

**Fraudulent
Dental
Degrees.**

Last year, at the request of the committee, it was relieved of the task of endeavoring to suppress illegal and fraudulent degree-granting institutions, but, as it was already identified with the work, we found that we could not detach ourselves from it entirely. Letters and complaints were persistently directed to us instead of to the Law Committee, to which the subject had been referred. Besides, the diplomas which were sold by the fraudulent schools, and the principal attendance

upon those which had a legal existence, but which are unrecognized and unaccepted here, was chiefly in and from foreign countries. Hence its consideration properly belonged to the Foreign Relations Committee and we could not well refuse to receive the complaints and do what we could in the premises. In our last report we made public the fact that a number of the fraudulent institutions were suppressed and their conductors imprisoned. We hoped that this would practically close up all of them, but special circumstances have intervened to protect certain ones, and the work is not yet completed.

**Evil Results
from Illinois
State Laws.**

It is not generally known in this country that thousands of fraudulent diplomas have been sold abroad. Were it possible for foreigners to distinguish between the reputable and the disreputable schools, this would not so much matter, but the statutes of the State of Illinois, under which it is possible to incorporate degree-granting institutions, which have practically no State supervision or responsibility whatever, and which with legal sanction are, under the great seal of the State, certified as lawfully organized colleges by the Secretary of State of Illinois, simply encourage the fraud. By that certification of the Secretary of State, the most unblushing impostures are placed apparently upon the same plane with reputable institutions, and foreigners are deprived of all means by which they can positively determine which is worthy recognition and which is not. As a consequence, some foreign governments have used this condition, either honestly or as a desirable pretext, to discriminate against all Americans, and have refused them permits to practice, and positively prohibited under heavy penalties the employment by any one of the American degree or title. This interdiction is spreading very fast, and, unless something is done to forestall it, soon the possession of an American diploma, whether legitimately or illegitimately obtained, will be a positive detriment to a practitioner. In fact, that is the case today in some parts of Germany. The influence of such enactments upon American educational affairs and upon the members of this association may, perhaps, be imagined. Already prohibition is practically accomplished in Southern Germany, is impending in Northern Germany, has been commenced in France, in Italy, and other countries, and there is sharply threatened a combination of all Europe against the American dental degree and the American dental school.

Much of this may, with a considerable degree of justice, be charged against the State of Illinois. Its own legislation has fostered the fraudulent schools that have brought this disgrace upon us. Its dental profession is not without responsibility. When has any body of its dentists put forth any special efforts to bring about a reform? The State has one of

the best State dental societies in existence, with a large surplus in its treasury. For many years it has been a leader in thought, because within its membership has been found a great number of the very ablest men in dentistry; men who have done as much to advance dental practice as have any others. The papers read before that society have challenged the attention of the world. Many of the members must have known something of the opprobrious professional legislation upon the statute books. Not a voice has been raised in denunciation of the condition, not a word has been uttered, until at the last annual meeting a mild resolution deprecative of the infamous traffic was offered by one unconnected with either schools or boards.

The State Dental Examining Board of Illinois has practically recognized fraudulent and irregular colleges, schools either without any regular course of instruction, or with but a very insufficient one, by admitting their students to the State examination and licensing them to practice, and by practically certifying to the regularity of institutions which every dentist in America knows, or should know, are conducted solely for whatever of revenue there may be in it. The law admits to the State examination for practice any one who asks for it, and the State Board of Dental Examiners has given the known fraudulent institutions a quasi status by admitting those holding their purchased diplomas to the examination, passing them and giving them the certificate which makes of them regular and legal practitioners. This has been done under the law, but it is Illinois law, and the profession of the State is doing nothing to bring about a reform that professional decency imperatively demands. It is time that the many high-toned professional men of the State were aroused to the stern accountability to which they are liable to be called.*

In directing attention to this, your committee must, in justice to the profession of the State, urge that in the opinion of some it has not been wise to admit that which has a real existence, in the hope that the State Board of Health and the medical profession might without scandal succeed in bettering the condition. Surely it must be now apparent to every one that the great work demands the most earnest efforts of every honest

*Subsequent to the reading of this report at a meeting of the National Association of Dental Faculties, about three thousand dollars was raised within an hour for prosecution of the work of reform. The National Dental Association afterward appropriated one thousand dollars more. Before the close of the Milwaukee meetings, however, the Illinois dentists in attendance actively commenced the work on their own account, and within a week secured the appointment of a new State Dental Examining Board, while a part of the old board were placed under arrest for malfeasance in office, and for general fraudulent practices. Proceedings were also very promptly commenced to annul the charters of certain irregular or fraudulent schools, and the prospect is very encouraging for the entire removal of the reproach that has so long rested upon them, thus verifying the confident predictions of the committee, that when the profession of the state were fully awakened to the real condition it would without delay be purified as by fire.—B.

dentist of the State. The excellent schools of Chicago have not hesitated to step into the breach when educational interests and professional progress were threatened by the action of other State examining boards. Why should they not attempt a reform in the State law under which their own board acts?

**Action by
Illinois State
Board of
Health.**

Last year your committee was able to report that the worst of the fraudulent schools of Chicago had been closed and that their conductors were in prison. That which was done was to a large degree the work of the State Board of Health of Illinois, which brought suit under the United States laws that forbid the use of United States mails for fraudulent purposes. In no other way could the general government at Washington interfere, because in all educational matters each State is autonomous, that being one of the reserved interests not delegated to the general government. The Board of Health being a State institution, it could commence proceedings in the name of the State, and use State funds for the prosecution of the criminals. It has been appealed to by your committee to take up the fraudulent issue of dental degrees, but the following letter will show that it purposes to confine its labors to the suppression of the sale of medical diplomas:

STATE BOARD OF HEALTH, STATE OF ILLINOIS, SPRINGFIELD.

OFFICE OF THE SECRETARY, July 13, 1901.

DEAR SIR.—Your letter of the 3d was received during my absence in the North. In regard to the sale of dental diplomas in Illinois, I cannot give you the letter you desire, for this board is taking no steps whatever to break up the traffic in these degrees. Through the efforts of this board the sale and barter of medical degrees has been entirely suppressed, and the persons who formerly made a business of selling degrees in medicine are now in jail.

With the assistance of the governor of the state and a few medical men we succeeded in getting legislation passed in 1899 by means of which it is a very easy matter to summarily close up any institutions selling degrees in medicine, dentistry, or pharmacy. Under this law the notorious "Metropolitan Medical College" has been closed.

There seems to be no reason why the State Board of Dentistry cannot take action in the matter of sale of dental degrees. If the board chooses it can suppress within two weeks the institutions the "diplomas" of which are sold in Munich or elsewhere. Why this board has taken no action on these lines I am unable to say. The State Board of Health sees no reason why it should assume duties which devolve upon another board. If any medical degrees are sold in this state, I am not aware of the fact. If proof of such sale be presented to this board, the institution or institutions in question can be closed within a month.

Very truly yours,

J. A. EGAN, *Secretary.*

It may thus be seen that we are thrown upon our own resources in the work of closing the institutions engaged in granting fraudulent or irregular dental degrees, and can look to the medical profession for no assistance. Your committee feels confident it can, within a short time, close up the last of the fraudulent schools, if a sufficient sum of

money can be placed at our disposal, and we are so advised by very competent legal counsel. We are prepared to submit a plan of procedure to this association.

**American
Educational
Affairs
in Europe.**

During the past year professional events in Europe having relation to American educational affairs have crowded upon each other's heels in rapid succession. Partly as the result of the appointment of the Foreign Advisory Committees by the association, and more especially through the action of United States governmental agents abroad, an attempt has been made to stem the tide which is so unjustly setting against us in Europe. The papers relating to such action were promptly sent to your committee. We recognized the fact that the purification of the stream must commence at the fountain-head. Practically no fraudulent degrees are sold in America; the countries of Europe are the sea into which the foul tide empties, and the sweetening of the waters cannot be effected there. It is in this country that the remedy must be applied, and until a healthy public and professional sentiment can be evoked here nothing can be done. The condition has existed for years, and it is constantly growing worse. A pest-hole cannot be cleansed until it is uncovered. A festering wound must be laid open that access can be obtained to its foulest depths. The community must be convinced from whence an infection proceeds before it will abolish the source. Few dentists are aware of what exists in this country. Any man knows that when the honest intelligence of our profession is fully awakened to any enormity, it will move heaven and earth, if necessary, to put an end to it.

Your committee seized upon the opportunity of the presentation of the most damning proofs coming from official sources to show to the dentists of America what really existed in their midst. Nine out of ten of them had little conception of the condition. When your committee, in its annual report for the year 1898, presented at Omaha, in part laid bare the grossness of the traffic in dental diplomas, the statement was received with incredulity. When that report had been softened in some of its expressions, because a part of the committee feared it was exaggerated, it was even then a matter of amazement, and in no place more so than in the State of Illinois. But when inquiry revealed the fact that the half had scarcely been told, the deepest indignation was expressed. All the best of the general educational institutions of the State combined to bring about reform. In their wrath and righteous exasperation they went before the Legislature, and met with defeat, because their statements were disputed and their motives impugned by the men whom they attacked. They had no fully awakened public sentiment

back of them. Very few were aware of the enormity of the fraud. Their facts were met by counterbalancing statements on the part of men whose honesty had not before been impeached; a flank movement was successfully maneuvered; they themselves were accused of improper motives, and the Legislature refused to act. Then an attack was made through the United States courts, which were not under the influence of public opinion, and they succeeded in breaking up a part of the iniquity and in getting through an amendment to the law under which it is possible to annul the charter of an openly fraudulent college. But new charters were easily obtained by the same men, and the work was recommenced under another name. The snake at best was scotched, and not killed. The time for another awakening seemed ripe, and your committee applied to the Secretary of State of the United States at Washington for permission to publish the official reports made to it by Consul Worman, of Munich, Germany. We believed that such publication, under the high sanction of the United States Government, of official documents would challenge the attention of American people and greatly tend to produce a public sentiment powerful enough to sweep the fraudulent colleges from the face of the earth. Will it be believed?—from high places came public criticisms and protests against any open attempt to break up the infamous traffic which had seriously involved the reputation of every American school!

The name of Consul Worman has been mentioned. Your committee believes that his efforts to rehabilitate the American degree in Europe have been, and promise to be, of the greatest benefit to dentistry, and his work should be sustained by every one. Your committee has not been able to give him all the assistance it desired, because it was this year without the credit upon the treasurer of the association that has been accorded it in the past, but it hopes that the good work may not be hindered by this obstacle in the future. Our national, our professional, our individual reputations are at stake. The good name of every member of this association is in the balance, and our vindication from a foul blot upon our professional escutcheon must not be a matter of indifference. To assume that this is in the interests of antagonistic foreign governments, that it is doing their dirty police work, is to attempt to cover up and apologize for and justify the villainy that is being done in our names; to assume complicity with the men who are trading on our good deeds, and who, under cover of the high reputation of American dentistry, won by us, are endeavoring to foist upon foreign communities a counterfeit that must of necessity throw doubt upon the original.

**Foreign
Dental
Schools.**

In the face of the fact that a most determined effort is being made in some foreign countries to break down the reputation of American dental schools, and to discredit all American professional education, and in the knowledge that not only are our courses refused any consideration, but sometimes made a pretext upon which to forbid Americans to enter upon practice, this association cannot be accused of illiberality or of professional narrowness should it decline to accept foreign qualifications as a sufficient warrant for practice in this country. There should be some kind of reciprocity in professional affairs, and Americans ought not to be expected to extend all the professional courtesies granted. And yet exact justice might, in the minds of many, demand that, irrespective of what may be done to us, we should be forgiving, and in return for the buffetings that we receive, humbly expose the other cheek to the smiting hand. That course is, perhaps, highly Christian, but it is not quite in accordance with the impulses of an ordinary human nature. The man or the school that does not have sufficient self-respect to maintain inalienable rights can scarcely expect to receive the consideration which may be honestly due.

But were this the only reason to be urged against the unquestioned acceptance of all foreign qualifications, we might justly be called churlish and professionally illiberal were we to exclude any one who asked our recognition. America was the first to establish any system of dental education. It embraced a full course of instruction, the whole of which must be covered within the walls of a duly chartered institution devoted to dental instruction. It was provided that all work leading to our special degree must be done under the direct supervision of qualified and accepted teachers. Recognizing the prosthetic department as one of the most important in dental practice, we insisted that it must have a scientific basis, and not be a matter of mere empiricism. We established the principle that our students must be under the pupilage of one who was acquainted with mechanical laws, and that the teaching of physical science should not be entrusted to possible charlatans. The instructor in mechanics must be responsible to the authority which granted the diploma or certificate of qualification.

The opposite course was pursued in founding the dental system of education in some other countries. Recognizing that many skilful mechanics were outside the pale of the fully qualified men, they practically excluded prosthetics from the college curriculum, classed mere mechanical skill as handicrafture, and permitted its instruction to be received at the hands of irresponsible men. They established a system of apprenticeship which in a manner bound out the student to a dental

mechanic, who should give him instruction in one of the most important departments of dentistry. It could not be expected that we should accept such instruction as the equivalent for our full college courses. This condition was the most embarrassing question that came before your committee in the attempt to establish a system of equivalents. Our schools refuse to give to an American student any advanced standing for time spent in the laboratory or office of a practitioner who has not teaching experience and responsibility. The matriculant may have passed years in a dental office, but he must join the freshman class on entering our colleges. Our diplomas, or certificates, are only granted upon the completion of a definite scholastic course. Occasionally some one has urged that merit and knowledge and skill should be recognized wherever found, and without reference to their source. But that is the very pretext urged by the fraudulent and short-term schools for the granting of their honors after an incomplete course, they themselves conducting the examination, and being the sole judges of that skill and merit.

Why American colleges or college men should desire to shorten the usual term is past comprehension, for it is prejudicial both to their educational and their financial interests. A degree is granted as a reward for the completion of a full course. It is not a recognition of merit. No two men reap the same advantages from a given amount of instruction. One man graduates a skilled, dextrous practitioner, while another is much his inferior. But both have earned their diploma by having successfully completed a prescribed course of study. Many men in the profession do not comprehend this, and blame the schools because a graduate is not as clever and expert in his technical manipulation as the experienced practitioner. Our schools demand the successful completion of a definite course in mechanics. We cannot recognize the qualifications of any man who has not complied with a reasonable requirement that is demanded of our own graduates. We cannot accept the course of any school that does not require this and your Foreign Relations Committee has not recommended as the equivalent for ours the certificates of any such schools. The most that we can do for those that accept the apprenticeship system as a part of their course is to give one year's advanced standing for the completion of a full and complete three or four years' pupilage with final graduation.

Under our present legislation it is illegal and irregular for any member of this association to admit to its senior class any student who has not at least the following qualification:

Successful completion of two full terms in a dental school *whose course has been accepted by this Association as a full equivalent for its*

own, and who shall by that school be recommended for such advanced standing.

Admission to the second or junior class of any of our schools can only be permitted to those who have one of the following qualifications:

(1) Successful completion of one full term in a dental school whose course has been accepted by this Association as a full equivalent for its own courses, the student being by that school recommended for such advanced standing.

(2) Successful completion of the full course of some regular and duly accepted medical school, and graduation with the degree of Doctor of Medicine.

No partial courses are accepted, nor those spent in a school not fully and definitely recognized by this Association. Surely we cannot grant more than this to those making application from foreign countries while denying it to our own people.

This principle has governed the Foreign Relations Committee in making its recommendations for the recognition of foreign schools. There have been urgent requests for such recognition, but your committee has not felt itself at liberty to recommend what is not granted to our own schools and people. If any foreign school will demonstrate that its curriculum of study is the full equivalent of our own, and that it has complied with the statute of minimum requirements established by this Association at its last annual meeting, your committee will be prepared to examine its claims and to recommend such action to this Association as the course of study seems to warrant.

Your committee, in conclusion, points with no ordinary pride to what has been accomplished within the past five years as the result of an attempt to regulate our relations with foreign schools and foreign students, and to the high professional ground on which we now stand. There should be no further complaints, on the one hand that we accept unqualified men from abroad, or on the other that foreigners can come here, and, without going through the full course demanded of American students, carry off our honors and claim to be American dentists, the colleagues of those who have completed our full curriculum of a broad course of dental study.

The foreign advisory boards, appointed with the approval of this Association, have proved to be useful auxiliaries in the carrying out of our system of education. In Europe they have completed an organization, and will henceforth work together in harmony. They must exercise an important and wide influence in educational affairs, and their action cannot but be for good. They will guard the interests of those holding the American degree, and help to prevent it from being unworthily con-

ferred. Your committee has made some further appointments in countries heretofore unrepresented, which it reports for approval. It is very much to be desired that at each of our annual meetings representatives from these foreign advisory boards should be in attendance whenever possible, and we recommend the enactment of a standing resolution giving to such regular representatives a seat in our meetings with the usual privileges of the floor.

**Foreign
Equivalents as
Amended.**

Were your committee to follow the precedent set by most foreign countries, no consideration would be given to their qualifications. Although America set an example to all the world in establishing a definite curriculum of instruction for dentists, in organizing schools for their theoretical and practical training, thereby erecting into a recognized profession or specialty that which previously was mainly empiricism and charlatanry, no official recognition of its special curriculum has ever been given by the dentists of foreign countries, although in great numbers they have attended our schools to obtain the advantages offered by that curriculum.

Your committee believes it to be neither fraternal, professional, nor just to adopt the same course, but thinks it both expedient and right to extend proper recognition to whatever can be received as an equivalent for our own courses. It must not be forgotten, however, that the system of dental instruction in Europe varies very widely from that of our special American schools. Instruction separate from that afforded by the medical schools or universities is very rare, and the practical training which forms a part of our curriculum is usually given by private preceptors. Your committee does not feel at liberty to recommend the acceptance of an oral and theoretical course as the equivalent for one including practical work. We cannot believe that the certificates of private and irresponsible practitioners can by us be accepted as any part of a college course, and hence we have given them little consideration.

Australia.

A very complete report from the various colonies of Australia and New Zealand has been made by the advisory board appointed for those countries. It would appear that in most of the colonies there is no dental legislation, but Victoria has lately secured a law analogous to that of England, and in Melbourne a dental school has been organized whose curriculum, from the partial syllabus furnished, seems to be a comparatively broad one. The institution has been but recently established, and your committee has been unable as yet positively to determine whether in all respects it complies with our minimum requirements. When this shall have been

definitely determined, we shall be prepared to recommend to this body some proper action.

In the provinces of Western Australia and Tasmania no dental legislation has been secured.

There is a dental law in New Zealand, and the member of the advisory board from that province has furnished your committee with an abstract of it. There are no dental schools in the province.

This is a Republic analogous to our own country in some respects, the federal union being composed of separate cantons. There are some excellent universities which offer certain facilities for dental study, but their practical instruction, we believe, cannot be accepted as an equivalent for that offered by American dental colleges. Your committee recommends that holders of the Swiss national diploma be given one year's advanced standing in the schools of this Association, but that no consideration be at present extended to holders of the cantonal qualifications.

The Spanish requirements in medicine are very high, but your committee has not learned that there are any dental schools, or dental departments of universities, whose course of instruction can be accepted as the full equivalent for the instruction given in American dental colleges.

In accordance with the recommendations of the advisory board for this country, your committee recommends as follows:

That one year's advanced standing be given to students possessing the French Government diploma of "*Chirurgien Dentiste*" who have completed the three years' course in either the "*Ecole Dentaire de Paris*," or the "*Ecole Odontotechnique*," and that the same consideration be given the French diploma of Doctor of Medicine.

That in all cases the American preliminary examinations as to educational requirements be demanded, and that a sufficient acquaintance with the English language to enable the student to comprehend lectures be an essential.

Your committee recommends that students speaking the English language, who have taken the full dental course in German or Austrian universities, be eligible for reception in the second-year classes of American dental colleges, provided it be shown that they have had at least two semesters of competent college instruction in practical laboratory and operative work.

**Germany and
Austria.**

Italy. There are, we believe, no schools in Italy which have courses that can be accepted as equivalent to those of our American dental schools. The instruction given in the medical schools your committee believes to be too exclusively general in its character to form an acceptable course in dentistry for American students.

Holland and Belgium. In these countries the title of dentist is obtained by passing a practical examination in the theory and practice of dentistry. There are no separate dental schools, and we are not sufficiently informed of the comprehensiveness of the syllabi of the universities to offer any recommendations concerning them.

Great Britain. Your committee recommends that all students who shall have finished the complete course in any recognized English, Irish or Scotch dental school or hospital, shall be eligible for reception as second-year students in American dental colleges, upon proof of their having taken as a part of such foreign course, two years of instruction in a properly equipped dental laboratory and dental infirmary connected or affiliated with such dental school or hospital, and which requires the successful completion of the work deemed essential by recognized American schools, as formulated in the minimum requirements for foreign dental schools accompanying this report. We further recommend that for the present no consideration be given to partial courses in any of the dental schools of Great Britain.

Denmark, Sweden and Norway. Sweden has one dental school, which is the dental department of the Caroline Medico-Chirurgical Institute of Stockholm. Instruction is given by five professors of the medical department, and there are three dental professors, occupying respectively the chairs of dental surgery, operative dentistry and dental prosthetics and orthodontia. From the assurances given, your committee believes that its graduates should be permitted to enter the second-year class of recognized American dental colleges, provided they shall have complied with our requirements concerning mechanical laboratory work.

Your committee has not sufficient knowledge concerning any school in Denmark or Norway to warrant further recommendations at present.

Japan. There is one dental school in Japan. It confers no degree, but gives a certificate which entitles the holder to government examination, the same as if he had studied with some practicing dentist. As the instruction is personal

and the school is quite irresponsible, your committee believes that no consideration can be given to those completing its courses.

Mexico. There is a medical school in the City of Mexico which purports to give dental instruction. Your committee cannot learn that it is of such a character as will enable it to be accepted as the equivalent for a course in an American dental college.

Canada. There is but one school in the Dominion, so far as your committee is aware, whose courses can be accepted as an equivalent for those of our own colleges, and that is at present a member of this body, so that it requires no special ruling.

Other Foreign Countries. Concerning the educational status of other nations, your committee is not in possession of sufficiently definite information to warrant any action whatever. We have no knowledge of the existence of any courses of instruction which can be accepted as an equivalent for the courses in the institutions having membership in this body, and, therefore, advanced standing in our schools cannot, in justice to our own students, be granted, save in the instances above enumerated.

Minimum Requirements. That a proper standard may be adopted by which the relative value of the courses in foreign dental schools, whose students offer them as equivalents for a part of the instruction given in the colleges of this Association may be determined, your committee recommends the approval of the following as the minimum of requirements demanded.

1. The college must require of matriculants a preliminary education which is the full equivalent of that demanded by the schools of this Association.

2. The college must demand of students full attendance upon at least three full annual courses (not semesters) of lectures of not less than seven calendar months each in separate years, covering all the studies proper to a full dental curriculum.

3. The college must possess a bacteriological laboratory with sufficient of equipment for instruction in a competent course in bacteriology, which must form a part of its curriculum of study.

4. The same must be required in chemistry, histology and pathology.

5. There must be a technic laboratory in which shall be taught the proper manipulation for the insertion of all kinds of fillings for teeth, the preparation and filling of the roots of teeth, the tempering and shaping of instruments, the drawing of wire and tubing for cases in orthodontia, and the cutting of bolts and nuts.

6. There must be prosthetic laboratories sufficiently equipped for teaching all kinds of prosthetic work, and the construction of all the approved prosthetic appliances.

7. There must be a sufficiently equipped laboratory for instruction in making crowns and bridges, and the construction of appliances used in orthodontia.

8. There must be a properly equipped infirmary or surgery for the reception of patients, upon whom each and every student shall be required individually to perform all and enough of the operations necessary in dental practice thoroughly to qualify him for the successful pursuance of his profession.

9. Complete records of the work done by each student, of his attainments at sufficient and full examination in each subject of the curriculum of study, of his attendance and deportment during the course, must be permanently kept.

10. No credit must be allowed for any work not done under the immediate supervision of instructors connected with, or especially approved by the college, and who are in direct affiliation with the faculty.

FOREIGN ADVISORY BOARDS.

The following is a list of the countries for which advisory boards have been designated, and the appointments and nominations so far as made:

COUNTRY.	NAME.	COLLEGE.	POST OFFICE ADDRESS.
Great Britain.....	Wm. Mitchell, D.D.S.....	Univ. of Michigan.	39 Upper Brook St., London, England.
" "	W. E. Royce, D.D.S.....	Phila. Dental Coll..	2 Lonsdale Gardens, Tunbridge Wells, Eng.
" "	B. J. Bonnell.....	.....	94 Cornwall Gardens, So. Kensington, London.
Holland and Belgium....	J. E. Grevers, D.D.S.....	.....	13 Oude Turfmarkt, Amsterdam, Holland.
" "	Ed. Rosenthal, D.D.S.....	Harvard Univ.....	19 Boul. du Regent, Brussels, Belgium.
" "	C. Vander Hoeven, D.D.S..	.....	Der Haag.
Denmark, Swe. & Nor'y..	Elof Forberg, D.D.S.....	Phila. Dental Coll..	Sturegatan 24, Stockholm, Sweden.
" " " ..	S. S. Andersen, D.D.S....	Univ. Pennsylvania.	Christiania, Norway.
" " " ..	L. P. Vorslund-Kjaer, D.D.S.	Phila. Dental Coll..	Copenhagen, Denmark.
Russia	H. V. Wollison, D.D.S....	N. Y. Coll. Dent...	10 Quai de l'Amaranti, St. Petersburg, Russia.
"	Theo. Weber, D.D.S.....	N. Y. Coll. Dent...	Helsingfors, Finland.
"	Geo. Th. Berger, D.D.S....	Phila. Dental Coll..	St. Petersburg, Russia.
Germany	W. D. Miller, D.D.S.....	Univ. Pennsylvania.	Victoriastrasse 30, Berlin, Germany.
"	C. F. W. Bodecker, D.D.S..	N. Y. Coll. Dent...	55 Unter den Linden, Berlin, Germany.
"	Freidrich Hesse, D.D.S....	N. Y. Coll. Dent...	Goethe Str. 6, Leipzig, Germany.
Austria and Hungary...	Otto Szigmondi, M.D., Ph.D.	Univ. Vienna.....	Schmerlingplatz 2, Vienna I, Austria.
" " ...	Rudolf Weiser, M.D., Ph.D..	Univ. Vienna.....	Frankgasse 2, Vienna IX, Austria.
" " ...	Dr. Jos. Arkövy.....	Univ. Buda-Pesth..	Váci-utca, Budapest, Hungary.

ITEMS OF INTEREST

FOREIGN ADVISORY BOARDS—*Continued.*

COUNTRY.	NAME.	COLLEGE.	POST OFFICE ADDRESS.
Italy and Greece.....	Albert T. Webb, D.D.S....	Univ. Pennsylvania.	87 Via Nazionale, Rome, Italy.
" "	Tullio Avanzi	Nominated	10 Via Tornabuoni, Florence, Italy.
" "	A. V. Elliott, D.D.S.....	Univ. of Mich....	39 Boul. Malesherbes, Paris, France.
France	J. H. Spaulding, D.D.S....	Univ. of Minnesota.	74 B'd Haussmann, Paris, France.
"	George B. Hayes, D.D.S....	Univ. of Michigan.	Paseo de Recoletos 3, Madrid, Spain.
"	G. A. Roussel, D.D.S.....	N. Y. Coll. Dent...	Serrano 5, Madrid, Spain.
Spain and Portugal....	R. H. Portuondo, D.D.S....	Univ. Pennsylvania.	Bilboa, Spain.
" "	Florestan Aguilar, D.D.S....	Phila. Dental Coll..	St. Alban, Anlage, Basel, Switzerland.
" "	T. J. Thomas, D.D.S.....	.....	14 Tonhallenstrasse, Zurich, Switzerland.
Switzerland and Turkey..	L. C. Bryan, D.D.S.....	Boston Dent. Coll..	12 Rue de Candolle, Geneva, Switzerland.
" " ..	Theo. Frick, D.D.S.....	Univ. Pennsylvania.	.....
" " ..	Paul J. Guye, D.D.S.....	Penn. Dent. Coll..	Shanghai, China.
Japan, China and India..	J. Ward Hall, D.D.S.....	.....	.....
" " "
Australia & New Zealand.	Alfred Burne, D.D.S.....	Phila. Dental Coll..	1 Lyon Terrace, Liverpool Street, Sydney.
" " " ..	Dr. A. P. Merrill.....	Phila. Dental Coll..	52 Collins St., Melbourne.
" " " ..	Herbert Cox, D.D.S.....	Univ. of Michigan.	216 Queen St., Auckland, New Zealand.
Cuba & W. India Islands..	.....	.....	.....
" " " ..	Rice R. Buchanan, D.D.S....	.....	47 San Francisco St., San Juan, P. Rico.
" " " ..	A. E. Mascort.....	Nominated	Havana, Cuba.
Mexico & Cent. America.	H. W. F. Buttner.....	Nominated	City of Mexico.
" " " ..	J. W. Purnell.....	Nominated	Merida, Yucatan.
" " " ..	J. Hunter.....	Nominated	Puerto Cortez, Honduras.
Venez. Colom. & Ecua'r..	Manuel V. Toledo.....	Nominated	Caracas, Venezuela.
" " " ..	J. R. Martinez.....	Nominated	Guayaquil, Ecuador.
Peru, Bolivia & Chile...	Charles B. Davies, D.D.S....	Penn. Dent. Coll..	49 Plaza Anibal, Pinto, Valparaiso, Chile.
" " " ..	S. R. Salazar, D.D.S.....	Chic. Coll. Dent. Sur.	Lima, Peru.
" " " ..	C. W. Sparrock, D.D.S....	Nominated	Lima, Peru.
Brazil and Guiana.....	J. L. Fordham.....	Nominated	Rio de Janeiro, Brazil.
" " " ..	Julius Weinburger.....	Nominated	Para, Brazil.
Argentina, Para & Uru.	J. S. Burnett.....	Nominated	Salto, Uruguay.
" " " ..	J. C. Macartney.....	Nominated	Montevideo, Uruguay.

MEMBERSHIP OF THE NATIONAL ASSOCIATION OF DENTAL FACULTIES,
AT ADJOURNMENT, JULY, 1901.

The following is a list of the dental colleges of America which, at the present time are members of the National Association of Dental Faculties, whose diplomas and tickets alone are recognized and received by the members of the Association.

Alabama	Birmingham	Birmingham Dental College.
California	San Francisco	Dental Dept. of College of Physicians and Surgeons.
"	San Francisco	University of California, College of Dentistry.
"	Los Angeles	College of Dentistry, Univ. of Southern California.
Colorado	Denver	Colorado College of Dental Surgery.
District of Columbia.	Washington	Dental Department of National University.
"	Washington	Dental Department of Columbian University.
"	Washington	Dental Department of Howard University.
"	Washington	Georgetown University, Dental Department.
Georgia	Atlanta	Atlanta Dental College.
"	Atlanta	Southern Dental College.

Illinois	Chicago	Chicago College of Dental Surgery.
"	Chicago	College of Dentistry, University of Illinois.
"	Chicago	Northwestern University Dental School.
Indiana	Indianapolis	Central College of Dentistry.
"	Indianapolis	Indiana Dental College.
Iowa	Iowa City	University of Iowa, College of Dentistry.
"	Keokuk	Keokuk Dental Col., Dent. Dept. of Keokuk Med. Col.
Kentucky	Louisville	Louisville Col. of Dentistry, Dept. of Cent. U. of Ky.
Louisiana	New Orleans	New Orleans College of Dentistry.
Maryland	Baltimore	Baltimore College of Dental Surgerv.
"	Baltimore	Baltimore Medical College, Dental Department.
"	Baltimore	Dental Department University of Maryland.
Massachusetts	Boston	Dental School of Harvard University.
"	Boston	Tuft's College Dental School.
Michigan	Ann Arbor	Dental College University of Michigan.
"	Detroit	Dental Department Detroit Medical College.
Minnesota	Minneapolis	College of Dentistry, Dept. of Med., Univ. of Minn.
Missouri	Kansas City	Kansas City Dental College.
"	Kansas City	Western Dental College.
"	St. Louis	Marion-Sims Dental College.
"	St. Louis	Missouri Dent. College, Dent. Dept. of Wash. Univ
Nebraska	Omaha	Dental Department University of Omaha.
New York	New York	New York College of Dentistry.
"	New York	New York Dental School.
"	Buffalo	University of Buffalo, Dental Department.
Ohio	Cincinnati	Cincinnati College of Dental Surgery.
"	Cincinnati	Ohio College Dental Surgery.
"	Columbus	Ohio Medical University, Dental Department.
"	Cleveland	Western Reserve University, Dental Department.
Oregon	Portland	North Pacific Dental College.
Pennsylvania	Philadelphia	Dental Department University of Pennsylvania.
"	Philadelphia	Medico-Chir. College of Phila., Dept. of Dentistry.
"	Philadelphia	Pennsylvania College of Dental Surgery.
"	Philadelphia	Philadelphia Dental College.
"	Pittsburg	Pittsburgh Dental College, Dept. of West. Univ. of Pa.
Tennessee	Nashville	Dental Department, University of Tennessee.
"	Nashville	Department of Dentistry of Vanderbilt University.
"	Nashville	Sch. of Dent. of Meharry Med. Col., Dept. of C. T. Col.
Virginia	Richmond	University College of Med. and Surgery, Dent. Dept.
Wisconsin	Milwaukee	Milwaukee Medical College, Dental Department.
Canada	Toronto	Royal College of Dental Surgeons of Ontario.

WILLIAM C. BARRETT,

208 Franklin St., Buffalo, N. Y.

JOHN D. PATTERSON,

Ninth and Walnut Sts., Kansas City, Mo.

TRUMAN W. BROPHY,

126 State St., Chicago, Ill.

M. W. FOSTER,

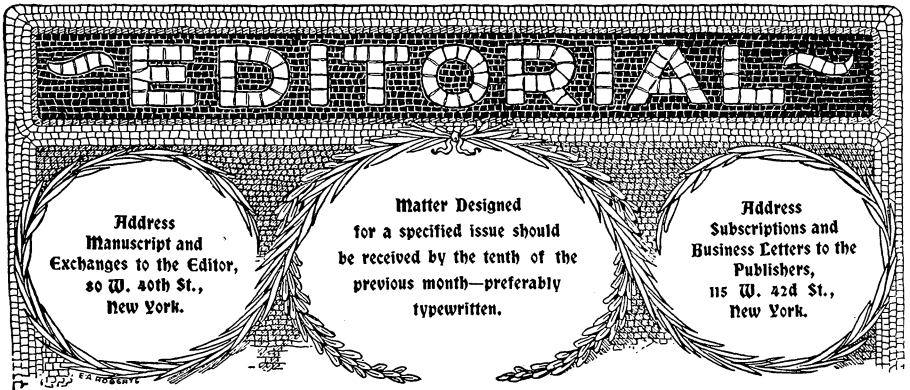
9 W. Fayette St., Baltimore, Md.

EUGENE H. SMITH,

283 Dartmouth St., Boston, Mass.

Foreign Relations Committee.





A Novelty in Cheap Diplomas.

We have just unearthed a "diploma" scheme which seems to be entirely unique, combining as it does the issuance of a pseudo-diploma in the guise of a certificate, with a method of advertising.

The name of the institution is the St. Luke's Hospital, of Niles, Mich. On the back of one of their choice bits of circular literature is a half-tone picture of a rather pretentious structure which might be the hospital, or the town hall. There is no name under the picture. The letter head informs us that the hospital was incorporated under the state laws of Michigan in 1898, and that the capital stock is \$100,000. Also that the corporation owns its own fireproof building with over five acres of fine shaded grounds.

The following letter unfolds the scheme:

"Niles, Mich., Sept. 24, 1901.

"DEAR DOCTOR: Enclosed please find some of our hospital literature for your careful perusal, together with one of our Physicians' Application blanks for you to fill out and return to us, should you decide to join our Dental Staff?

"The many advantages, privileges and financial benefits to be gained by your becoming one of us, are only partially told, as follows, viz.:

"1st—We issue, in addition to our certificate of membership, a very neat pocket lithograph Membership Ticket, which, we believe, if judiciously displayed, will pay for your certificate many times over during the course of a year.

"2d—We have just received from the manufacturing jewelers, a very costly and ornamental RED CROSS solid gold special emblem button for the coat lapel, lettered in circular form: "Staff:—St. Luke's Hospital," which goes free with each of our certificates of membership; or if ordered separately, \$2.00.

"3d—We will pay you a commission of 25 per cent. in cash for all surgical operations, and 10 per cent. on all medical cases you may send to our hospital for treatment.

"4th—Should you wish to consult us at any time regarding difficult cases, we will freely give you whatever assistance and advice we can, and will make you microscopical analysis of specimens sent us free of charge.

"5th—We charge nothing for nursing patients day or night, as part of the expense is taken from our Nursing Fund. We do charge, however, for board and rooms, ranging from \$1.50 to \$2.00 per day, according to location selected by patient.

"6th—After you have ordered and paid for your certificate of membership—*either in English or Latin*—should you so desire it, and will send us a list of names, not exceeding 12, including your local newspapers, we will write an individual letter recommending you to each one of them. Of course, these letters of endorsement are optional for you to accept or reject whichever you see fit.

"7th—You can have your name handsomely engrossed either in the old Round Hand Style of letters, or in the old English style, like the lettering upon the small fac-simile herewith enclosed, with DOCTOR OF DENTAL SURGERY or DOCTOR OF DENTAL MEDICINE following your name; or merely the initials D.D.S., or D.M.D., with any specialty you might wish added thereafter; or any other literary degrees you may have, etc.

"Now, Doctor, after carefully considering these features, we would ask with all fairness, do you consider it to your financial interests to have your appointment confirmed for your locality? An early answer will much oblige, fraternally yours,

ARTHUR C. PROBERT,
"President."

The above is an invitation to the dentist receiving the letter and circulars to make application for membership upon the "dental staff" of the hospital which membership, curiously enough, is not restricted to the immediate vicinity of Niles, Mich. A blank application is enclosed for the dentist to sign, at the bottom of which the scheme is expounded in fuller detail, thus:

"Please fill in this application form, returning it to us by early mail, and we shall take pleasure in placing your name in good standing upon the Medical and Dental Staff of our Hospital, entitling you to all the advantages and financial benefits of membership.

"Kindly select and mark with a cross thus: X, right over the priced certificate you desire to have sent, and remit us in advance the amount, together with this application form properly filled out, and we will have your certificate safely sent you by return mail. Should you prefer it, we

will send your certificate through any Bank you may name; Postmaster, or via American Express C. O. D., you to send us \$2 in advance, to apply on your account as a guarantee of good faith that you will promptly take your certificate from the Bank, post or express office when it arrives. If you remit us in advance you save this extra expense and delay.

"These certificates are artistically lithographed (size 19 x 25 inches) and set forth that the holder has been regularly appointed to the honorable ranks of A Member of our Staff of Medical and Dental Surgeons. These certificates are a great attraction to any Dentist's office. All the members of our Staff are delighted with them, and say that they impart confidence to their visitors and patients. They are truly a beautiful illustration of the higher art of the lithographer, and any Dentist ought to be proud to have one framed and hung upon the walls of his reception or operating room. It is something that increases the practice of the Dentist and wins him many dollars during the course of a year. These certificates will be delivered free, in tubes, by mail, and furnished as follows:

Heavy Royal Linen Paper, \$5.00; Imitation of Parchment, \$7.50; Genuine Sheepskin, only \$10.00.

"We send out all of our Certificates with your name handsomely engrossed thereon in Old English or Round Hand style of letters, with two pieces of dark blue ribbon and a large corporate gold seal affixed thereto, giving it the general appearance of a regular Hospital Medical or Dental College Diploma."

Thus whilst the dentist is made fully aware of the fact that he is paying his money for nothing but a certificate of membership on the staff of a hospital, he is naively informed that said certificate has "the general appearance" of a diploma. This indeed is true, for with the circular letter is also enclosed a reduced fac-simile of the membership certificate printed in Latin in imitation of a regular medical diploma, and it is noteworthy that here it is called a "fac-simile representing our lithographed hospital diploma." On the second page of this circular is a translation in English of this "diploma," in which it is plainly stated that the recipient has been appointed a member of the hospital staff. In the "diploma," whether in Latin or English, there appears conspicuously in the center in large type the word "Dr. John B. Toolidge, Doctor of Dental Surgery." It is therefore quite conceivable that, considering this together with the fact that the document resembles a diploma, any one, a patient, for example, unfamiliar with Latin would conclude that the paper really was a diploma conferring a degree.

It will be noted that an offer is made to send twelve complimentary

letters to persons to be nominated by the applicant. A copy of this letter is enclosed with the other "literature" and reads as follows:

"DEAR SIR OR MADAM: We beg respectfully to call your attention to the fact that on account of the excellent medical qualifications and high professional standing, we have recently elected and appointed as Visiting and Consulting Physician and Surgeon on the Medical Staff of our Hospital, Doctor....., of.....

"We have no hesitancy in recommending him to you, and should you, any member of your family, friends or acquaintances become sick and desire medical treatment, we wish to highly endorse the Doctor and recommend you to patronize him. Should you at any time desire the services of our Hospital for yourself, friends or acquaintances, he will make arrangements whereby you can come here for treatment.

"We have a first-class, up-to-date general Hospital, with all the home comforts and a Staff of eminent Physicians and Surgeons, and our charges are less than anywhere else you may go. Trusting that you will bear these facts in mind, believe us to remain, yours respectfully,

"....., Secretary."

"The above is a typewritten copy of a letter we send out upon our regular printed business letter-heads (twelve to each certificate holder) recommending and endorsing those members only WHO HAVE PAID FOR THEIR CERTIFICATES OF MEMBERSHIP. Should any members want more than twelve of these letters sent out in their behalf, they must send us extra postage stamps covering same. Of course, it is optional for members to say whether or not they wish any of these letters of endorsement sent out in their behalf, as some will claim it is against the unwritten laws of medical ethics."

The following, evidently intended as a voucher for the scheme, needs no comment, but is too rich to be omitted from the free advertisement here given to St. Luke's Hospital, of Niles, Mich.:

"322 West Seventeenth street,
New York City, Sept. 17, 1901.

"To the President and Officers of St. Luke's Hospital, Niles, Mich.

"DEAR DOCTORS: Your letter of the 16th to hand with Membership Card, and under separate cover my Latin certificate on sheepskin, also lapel button. I am very much pleased with certificate and upon close examination I find that every part of it is executed in the highest of workmanship manner; and the Red Cross lapel button is a wonder, and will inspire confidence to the most skeptical. Too much cannot be said for the whole outfit, as I consider it far superior to representation made in your printed matter that you sent to me. Call on me for favors at any time. I shall recommend your hospital to my friends and induce my professional friends to join your honorable ranks.

"With best wishes for success of hospital and all its undertakings, I remain, yours very truly, WALTER SCOTT, M.D."

There is no such name in the New York directory.

We now come to the part which affects the dental profession most nearly. Thus far the "scheme" seems adroitly to have been confined within legal limits, so far as we are competent to judge. But on their letter-heads appears a printed list of their present dental staff, at least two names being used without consent, viz., those of Drs. E. O. Kinsman, and R. M. Chase, whose letters on this subject appear elsewhere in this issue. We, therefore, deem it proper to print a full list of their "Dental Staff," requesting the gentlemen to communicate with us if their names have been used without permission.

The dental staff, as announced on the letter-heads, include the following:

"A. Dale Covey, D.D.S., M.D., Late Professor of Oral Surgery in the American Medical College of Indiana, Hahnemann Medical College and Hospital of Chicago; Rolla M. Chase, M.D., D.D.S., Tufts College Dental School of Boston, Sec'y Vermont Board of Dental Examiners; Hon. Daniel B. Ingalls, D.D.S., Tufts College Dental School of Boston; Edgar Osgood Kinsman, D.D.S., Boston Dental College, Sec'y Northeastern Dental Assn. and Mass. Dental Society; Howard R. Weber, A.M., M.D., D.D.S., University of Maryland; M. P. Beecher, D.D.S., Beecher's Dental Directory of the U. S.; Frank A. Godsoe, D.D.S., Boston Dental College; D. H. Dickerman, D.D.S., Registered with Connecticut State Dental Board; Mons C. Christensen, D.D.S., Licentiate Illinois State Board; Samuel K. Loder, D.D.S., Ph.G., Philadelphia Dental College; Wm. W. Ver Valen, D.D.S., Baltimore College of Dental Surgery; Gustave Newman, D.D.S., M.D., Licentiate Ohio State Boards; Chas. D. Allen, D.D.S., Louisville College of Dentistry; Isaac Douglass, D.D.S., M.D., University of Medicine and Surgeons, Philadelphia, Pa.; Charles D. Beardsley, D.D.S., M.D., American College of Dental Surgery of Chicago; Prof. John B. Coolridge, M.D., D.D.S., Formerly Professor of Mechanical Dentistry and Metallurgy, Boston Dental College; S. P. Earnest, D.D.S., M.D., Western University of Pennsylvania; Marion Holland, M.D., D.D.S., University of Michigan; Francis H. Chidester, D.D.S., Boston Dental College; Wm. E. Pilcher, D.D.S., American College of Dental Surgery, Chicago; James E. Low, D.D.S., Registered with Illinois State Board."

While waiting for disclaimers from these gentlemen, would it not be well for the State Dental Society of Michigan to investigate the hospital corporation situated at Niles?



CORRESPONDENCE

Affidavit from Dr. Edgar O. Kinsman.

To the Dental Profession of the United States:

Be it known that I, Edgar O. Kinsman, D.D.S., of Cambridge, Mass., secretary of the Massachusetts Dental Society and the North-eastern Dental Association, do hereby declare that the use of my name on the letter heads of the St. Luke's Hospital, of Niles, Michigan, is without my knowledge or consent. I declare it to be a fraudulent use of the same, and make this public declaration to set myself right before the profession, and maintain my honor as an officer of the above-named societies.

(Signed) EDGAR O. KINSMAN, D.D.S.
BOSTON, September 24, 1901.

Commonwealth }
of } Suffolk, s.s.
Massachusetts, }

Personally appeared before me, the above-named Edgar O. Kinsman, and made oath to the truth of the above statement, subscribed to by him.
Before me,

WALDO E. BOARDMAN, *Notary Public.*

Disclaimer from Dr. Rolla M. Chase.

Editor ITEMS OF INTEREST.

DEAR SIR: I was not aware, until I received your note, that I was on the staff of the so-called St. Luke's Hospital. I hope you will investigate the matter.

Fraternally,
Bethel, Vt., Oct. 21, 1901.

R. M. CHASE.

(The above was received in response to a letter from the editor, and a full *expose* of the methods of the St. Luke's Hospital will be found in the editorial department.)—[Ed.]

Letter from Dr. H. H. Sylvester, Berlin, Germany.

Published at the Personal Request of Dr. Capon.

MY DEAR DR. CAPON:

You are rather hasty in presuming that I lack appreciation of porcelain inlays. I have no remembrance whatever of the case you mention in the June number of *ITEMS OF INTEREST*,* but I do know that respect for dental ethics would prevent me from criticising a colleague of your well-known standing and ability. If I had found a failure, I first would have looked for some accident, not for lack of judgment.

In a modest way we make porcelain inlays also, and approve of them in their proper places, but we are rather averse to an indiscriminate use of them. We are charmed with the successful cases, and will not mention the failures found in our own and in the practice of others.

In my early practice I used gold as well as cement in fastening porcelain inlays, and in my practice of nearly thirty years in Berlin, I have used no other than the two mentioned, hence you may imagine my surprise at the import of your article, namely, that I am a stranger to the value of cement. If you question your medical friend critically, you may find another version of the affair.

Your article was charmingly written, and I hail with delight any improvement that can be made in this class of work. I have tried to hold the standard high in contour fillings, and where, in former days, I used contour work, as in your Fig. 3, I now use porcelain, but in a different manner. One of my favorite methods is building the tooth with gold down to the cutting edge, leaving space enough to insert a porcelain inlay. I build with gold so as to protect the porcelain filling, and allow to appear as little gold as my skill will permit. In these cases, I am obliged to make the porcelain so thin that there is always danger of its cracking, but I remember of only one failure of this kind.

This may, perhaps, convince you that I am not a stranger to your method of work, or to the virtue of cement for holding an inlay in place.

Very respectfully,

DR. SYLVESTER.

Berlin, August 2, 1901.

*The editor deeply regrets the oversight by which the matter complained of by Dr. Sylvester was published.



Massachusetts Board of Registration in Dentistry.

A meeting of the Massachusetts Board of Registration in Dentistry, for the examination of candidates, will be held in Boston, Mass., November 13, 14 and 15, 1901.

Candidates who have applied for examination will report to the secretary, Wednesday, November 13, at 9.30 a. m., at Tufts College Dental Infirmary, corner Huntington and Rogers avenues, and come prepared with rubber-dam, gold and instruments, to demonstrate their skill in operative dentistry. Any one who wishes may bring his patient. So far as possible patients will be furnished. The board in every instance selects the cavity to be filled. Partially prepared cavities never accepted.

The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridge work, orthodontia, anatomy, histology, surgery, pathology, materia-medica, therapeutics, physiology, bacteriology, anesthesia, chemistry and metallurgy, and will be held at Civil Service Rooms, State House, from Thursday, November 14, at 9.30 a. m., until Friday p. m., November 15.

All applications, together with the fee of \$20, must be filed with the Secretary of the Board, on or before November 6, as no application for this meeting will be received after that date.

Every candidate for examination must be 21 years of age.

Application blanks may be obtained from the secretary.

Candidates who have taken an examination, and failed, and desire to come before the Board again at this meeting, are not required to fill out a second application blank, but must notify the secretary as above in order to be examined. The fee for third and subsequent examinations is \$5.

G. E. MITCHELL, D.D.S., Secretary.

25 Merrimack St., Haverhill, Mass.

New Hampshire Dental Society.

The annual meeting of the New Hampshire Dental Society will be held at the Manchester House, Manchester, N. H., November 13, 14 and 15. All dentists residing in the State are invited to be present. Visiting dentists from out of the State will be welcome. A good programme is being prepared.

FRED. F. FISHER, Secretary.

Manchester, N. H.

Ohio State Dental Society.

The thirty-sixth annual meeting of the Ohio State Dental Society will be held at the Great Southern Hotel, Columbus, O., December 3, 4 and 5, 1901.

S. D. RUGGLES, Secretary.

Portsmouth, O.

Vermont State Board of Dental Examiners.

A meeting of the Vermont Board of Dental Examiners will be held at the Pavilion Hotel, Montpelier, Wednesday, December 11, 1901, at 2 o'clock, p. m., for the examination of candidates to practice dentistry.

The examination will be in writing, and include anatomy, physiology, bacteriology, chemistry, metallurgy, pathology, therapeutics, surgery, materia-medica, anesthesia, operative and prosthetic dentistry, together with an operation in the mouth.

Candidates must come prepared with instruments, rubber-dam and gold.

Applications, together with the fee (\$10), must be filed with the secretary on or before December 1.

GEORGE F. CHENEY, Secretary.

St. Johnsbury, Vt.

Oklahoma Board of Dental Examiners.

The following dentists compose the newly appointed Board of Dental Examiners for Oklahoma:

President, F. D. Sparks, Ponca City; Secretary, A. C. Hixon, Guthrie; Treasurer, J. Q. Waddell, Kingfisher; A. M. Detrick, Oklahoma City; S. A. Kelsey, Chandler.

The next regular meeting of the Board for examination of candidates will occur in Guthrie, Nov. 5th, 1901.

A. C. HIXON, Sec'y.

Guthrie, O. T.

Dental Commissioners of Connecticut.

The following Dental Commission has been appointed by the Governor of Connecticut:

President, Edward W. Pratt, East Hartford; Wm. H. Loomis, Rockville; W. E. Hyde, Danielson; Horace Bascom, New Haven; Recorder, J. Tenney Barker, Wallingford.

J. TENNEY BARKER, Recorder.

Wallingford, Conn.

Mississippi Valley Medical Association.

The twenty-seventh annual meeting of the Mississippi Valley Association adjourned at Put-in-Bay, after a most successful session, on the morning of the 14th, out of respect to our martyred President.

The following officers were elected for the ensuing year: President, S. P. Collings, M.D., Hot Springs, Ark.; First Vice-President, J. C. Culbertson, M.D., Cincinnati, O.; Second Vice-President, Paul Paquin, M.D., Asheville, N. C.; Secretary, Henry Enos Tuley, M.D., Louisville, Ky.; Treasurer, Thomas Hunt Stucky, M.D., Louisville, Ky.; Chairman Committee of Arrangements, A. H. Cordier, M.D., Kansas City, Mo.

Twenty-eighth annual meeting, Kansas City, Mo., October, 1902.

HENRY ENOS TULEY, Secretary.

Louisville, Ky.

National Association of Dental Examiners.

At the last meeting of the National Association of Dental Examiners, held at Milwaukee on August 2d to the 6th, the following officers and committees were elected and appointed:

President, John F. Dowsley, 175 Tremont St., Boston, Mass.; Vice-President, Chas. A. Meeker, 29 Fulton St., Newark, N. J.; Second Vice-President, J. A. Hall, Collinsville, Ala.; Third Vice-President, B. L. Thorpe, La Clede and Vandewenter Ave., St. Louis, Mo.; Secretary and Treasurer, J. Allen Osmun, 588 Broad St., Newark, N. J.

Committee on Colleges: Chairman, C. C. Chittenden, Madison, Wis.; J. A. Hall, Collinsville, Ala.; H. J. Burkhart, Batavia, N. Y.

Committee on Conference: Chairman, M. F. Finley, Washington, D. C.; E. E. Kirkpatrick, Oklahoma City, O. T.; Chas. A. Meeker, Newark, N. J.

Membership Committee: Geo. Everett Mitchell, Haverhill, Mass.; Melville A. Mason, Indianapolis, Ind.; Max N. Ebbel, Louisville, Ky.

Committee on Contracts and Arrangements: Chas. A. Meeker, Newark, N. J.

J. ALLEN OSMUN, Sec'y.

588 Broad St., Newark, N. J.

Southern Branch, National Dental Association.

At the fourth annual meeting of the Southern Branch of the National Dental Association, held at Nashville, Tenn., July 29th, the following officers were elected for the ensuing year:

President, H. H. Johnson, Macon, Ga.; First Vice-President, L. G. Noel, Nashville, Tenn.; Second Vice-President, Geo. S. Vann, Gadsden, Ala.; Third Vice-President, W. G. Mason, Tampa, Fla.; Treasurer, B. D. Brabson, Knoxville, Tenn.; Corresponding Secretary, C. L. Alexander, Charlotte, N. C.; Recording Secretary, S. W. Foster, Atlanta, Ga.

Executive Committee: E. G. Quattlebaum, Columbia, S. C., 1 year; I. Simpson, Rock Hill, S. C., 1 year; A. R. Melendy, Knoxville, Tenn., 2 years; J. G. Fife, Dallas, Tex., 2 years; V. E. Turner, Raleigh, N. C., 3 years; W. R. Slater, Knoxville, Tenn., 3 years.

The next meeting will be held in Atlanta, Ga., Feb. 18th, 1902.

H. H. JOHNSON, Pres.
Macon, Ga.